Section Two

Reports of the
Major Departments

Annual Report/1970

The Children's Hospital
Medical Center

Boston
Massachusetts

Children's/Boston

Senior Administration

as of July 1, 1971

Leonard W. Cronkhite, Jr., M.D.	*Executive Vice President*
David S. Weiner	*Director*
Mrs. Joanne B. Bluestone	*Associate Director*
Rudman J. Ham	*Associate Director*
William J. Brennan	*Director of Public Relations*
Albert L. Broseghini, Ph.D.	*Director of Research Administration*
Walton E. Devine	*Director of Fiscal Affairs*
William T. Kearns	*Director of Resources and Development*
George W. Lunn	*Director of Personnel Services*
Richard D. Mills *(Resigned 5-1-71)*	*Director of Patient Services*
Miss Muriel B. Vesey, R.N.	*Director of Nursing*

Staff Executive Committee

as of July 1, 1971

Charles F. Barlow, M.D.	*Neurologist-in-Chief*
Leonard W. Cronkhite, Jr., M.D.	*Executive Vice President*
Sidney Farber, M.D. *(Retired 9-1-70)*	*Chairman of the Staff and Pathologist-in-Chief*
Gordon F. Vawter, M.D. *(Effective 9-1-70)*	*Pathologist-in-Chief (Acting)*
Carlyle G. Flake, M.D. *(Retired 10-1-70)*	*Otolaryngologist-in-Chief*
Burton F. Jaffe, M.D. *(Effective 10-1-70)*	*Otolaryngologist-in-Chief*
George E. Foley, Sc.D.	*Staff Delegate, Children's Cancer Research Foundation*
M. Judah Folkman, M.D.	*Surgeon-in-Chief*
George E. Gardner, Ph.D., M.D. *(Retired 1-1-71)*	*Psychiatrist-in-Chief*
Julius Richmond, M.D. *(Effective 1-1-71)*	*Psychiatrist-in-Chief*
Melvin J. Glimcher, M.D. *(Effective 9-1-70)*	*Orthopedic Surgeon-in-Chief*
Robert E. Gross, M.D.	*Surgeon-in-Chief in Cardiovascular Surgery*
Sprague Hazard, M.D.	*President of the Medical Staff*
Charles A. Janeway, M.D.	*Physician-in-Chief*
Alexander S. Nadas, M.D.	*Chief, Cardiology Department*
Edward B.D. Neuhauser, M.D.	*Radiologist-in-Chief*
Arthur M. Pappas, M.D.	*Acting Chief of Clinical Orthopedics*
Richard M. Robb, M.D.	*Ophthalmologist-in-Chief*
Roger E. Sheldon, M.D.	*House Officers Chief Representative*
John Shillito, Jr., M.D. (Appt. Term. 12-31-70)	*Neurosurgeon-in-Chief (Acting)*
Keasley Welch, M.D. *(Effective 1-1-71)*	*Neurosurgeon-in-Chief*
Robert M. Smith, M.D.	*Anesthesiologist-in-Chief*
Lennard T. Swanson, D.M.D.	*Dentist-in-Chief*
David S. Weiner	*Director*

The Children's Hospital
Medical Center

comprising

The Children's Hospital Medical Center
Sarah Fuller Foundation for Little Deaf Children
The Sharon Sanatorium
Children's Cancer Research Foundation, Inc.
Judge Baker Guidance Center
Parents' and Children's Services
of The Children's Mission

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Administration

Great emphasis is being given today to the external affairs of hospitals and the manner in which the individual hospital fits into the community and the total health care organization. This concern is appropriate and necessary if hospitals and the health care system are to reach their maximum effectiveness. But it only deals with one side of the coin. The internal affairs of hospitals have much to do with hospital effectiveness and efficiency. No matter how well designed the hospital or the health care system, its ultimate purpose and performance resides at the point where things are done for – and to – patients. That is where the action is, and the most crucial and costly segment of that action occurs in the patient care areas – the nursing divisions, the emergency service, the specialty referral clinics. And these, too, are the sites of the most complex and difficult management situations in American enterprise. At each of these points a myriad of diverse activities must be merged into a cohesive, individualized service for each patient.

It is in the care of the patient that everything comes together. Certainly there the medical expertise of the doctor and nurse are focussed upon the individual patient's medical problem. There, too, the efforts of the wide variety of other health professions – dietitians, social workers, laboratory technicians, X-ray technologists, physical therapists, and others - come into play. But they are the players upon the stage, while behind the wings stand hundreds of other hospital personnel whose labors have made this moment of patient care possible.

Making patient care possible is the role of the personnel of nearly half a hundred departments and units at CHMC. Coordinating their efforts and providing them with the tools and the assistance they need to do their jobs effectively continues to be the commitment of our administrative staff.

The complexity of the situation can be illustrated by the reorganization and renovation of the Emergency Department at CHMC in 1970, necessitated by an increase of more than 30 percent in the number of patient visits in a two-year period, seriously affecting the capacity of the service.

The Department of Patient Services was the first administrative area involved. It conducted a careful patient utilization study and, in consort with the Departments of Medicine and Surgery redefined medical service needs. The Department of General Services then became involved in the development of physical structure plans for an enlarged emergency area. Since the redefinition required the reallocation of several functions in the area, the Department of Fiscal Affairs was brought into the picture to structure appropriate accounting procedures for the re-located functions – for which General Services not only had to find but also prepare suitable quarters.

Increased numbers of patients, as in the case of Emergency, almost invariably means more nurses, more physicians, more pharmacists, more clerical personnel; almost more of everyone. Unlike a manufacturing facility, a hospital cannot merely edge up the speed of the production line when product demand increases. To provide many of the staff needed for the enlarged Emergency Service, the Personnel Department had to become intimately involved.

By the time the service was completely reorganized and renovated, the number of service units that had contributed to the effort totalled more than 20 in number, including Engineering, Electrical, Central Supply, Social Service, Reception, Security, Communications, Supply Distribution, Housekeeping, Linen, Billing Services, Budget Operations, and Medical Records, as well as those earlier mentioned.

The breadth of input into the changes in the Emergency Service does not represent an isolated incident, and by hospital standards, in fact, was a relatively uncomplicated effort. Other examples, perhaps even more complex, would have been preparation and occupancy of the new, 14-story Laboratories for Pediatric Research, creation of a new Radiation Therapy area, expansion of Radiology, and others, all occurring during 1969 and 1970.

New Committees Formed

While the expansion and improvement of physical facilities may be the most easily recognized signs of progress in an institution, by no means need they be the most important. One very significant occurrence during the reporting period has been the establishment of a Joint Conference Committee and a Planning Committee.

The Joint Conference Committee, composed of three Trustees, three members of the Medical Staff, and two members of Administration, has been established as the mechanism for determining future directions and resolving major issues affecting the entire medical center, in keeping with requirements of the Joint Commission on Accreditation of Hospitals. The Planning Committee of six Medical Staff members and four members of Administration reviews proposed new programs and modifications in programs and physical structure, and recommends action to the Staff Executive Committee, Administration, and/or to the Joint Conference Committee. Through this process of first reviewing and developing a posture on all program recommendations, by such a combined committee, it is felt the efforts of Children's will more closely and more accurately reflect the needs of the institution.

On a non-program basis, perhaps the greatest need of Children's, continually, is personnel. As the numbers of patient visits increases, as new facilities are developed, and as new program begin, trained people must be provided in support. Usually, it seems, there are people in short supply, and to cope with this situation, as well as with developments indicative of the times, CHMC's Personnel Department of necessity has had to become increasingly sophisticated.

Illustrative of the kinds of issues faced by Personnel recently are two instances of complaints by the Massachusetts Commission Against Discrimination (in both cases findings favored the medical center), a series of exhaustive contacts with the Office for Civil Rights of the U.S. Department of Health, Education and Welfare, an organizational attempt by a labor union, and the necessity to review federal wage and hour law provisions.

The traditional Personnel activities – recruitment, salary evaluation, benefit improvements, etc. – were carried on in an untraditional manner concurrent with the problems noted above. And at the same time, the department stepped up efforts to not only employ more individuals from minority and disadvantaged groups, but to structure an upward mobility system within the medical center.

The upgrading of employment policies has been credited by Miss Muriel B. Vesey, R.N., Director of Nursing, as being at least partly responsible for a marked advancement in recruitment of nurses during the past two years. Staffing on the nursing divisions and in the outpatient department has shown a gratifying improvement, and a contributory reason, undoubtedly, is the variety of nursing duties of challenge to registered nurses. In an effort to keep the nurse's responsibilities interesting and intellectually satisfying, and to free them from customary clerical tasks, the unit management system has been initiated throughout the inpatient area, with clerical personnel on duty around the clock. This has resulted in more efficient performance of the clerical tasks and more concentrated nursing care of patients.

Patient care, undeniably, is becoming more demanding of the nursing service, and more complex. Accordingly, training and education programs for members of the nursing staff have, of necessity, become more sophisticated and extensive. This need is evident, as well, for nursing aides or nursing assistants, and stronger training programs for these valuable associates are being organized.

Nursing education, of course, is the *raison d'etre* for The Children's Hospital School of Nursing, which continues to admit about 50 students a year; approximately one of every five applicants. While recruitment efforts have, in general, been most satisfactory, they have failed to attract candidates from minority groups. Efforts to correct this situation are continuing.

The School's Curriculum Committee has redesigned the course of study for nursing students, shortening it by one quarter in the third year, with students now being graduated in June rather than September. The Committee is planning to include greater emphasis upon nursing in ambulatory services and in the community during the third year, while at the same time maintaining strong clinical experiences. These changes, it is hoped, will strengthen the program while shortening the course, in line with current trends.

A course for instruction of practical nursing students was discontinued in 1970, but the course for diploma schools continues, utilized by six educational institutuions.

The contribution of General Services during the last two years scarcely was limited to its aforementioned efforts in Emergency and Ambulatory Surgery. These were only two of more than half-a-dozen remodelling projects carried on by that department, which at the same time also was supervising completion of, and the move into, the new Laboratories for Pediatric Research building. In addition, General Services was reorganizing food service to provide all-night facilities for evening and night staff, as well as parents; was starting a pilot program for inpatient feeding through use of prepared foods and electronic re-heat equipment; was installing a permanent air conditioning system in patient rooms; and, was designing and installing a central electronic monitoring system for all sensing equipment, fire alarms, security calls, etc., as well as a new radio paging system for the entire hospital.

On top of all this activity, General Services also carried out the traditional responsibilities of housekeeping, maintenance, dietary service, etc., expanding efforts in those areas as the result of new facilities and new programs instituted by other departments.

If there is any doubt that hospitals are just as involved in the burgeoning problems of the day as are corporations in the profit sector of the economy, attention should be directed to the Department of Fiscal Affairs. There, personnel not only face situations identical to those of their industrial counterparts (prompt, accurate accounting; economic purchasing; efficient warehousing), but cope with matters unique to the hospital industry due to increasing governmental involvment.

Recent years have seen the beginning of deep state government engagement in hospital fiscal matters with the Title 19 Medicaid Program, and as in similar past instances this has not been a painless experience, either for the state or for the provider of care. Though problems remain monumental and there is much to achieve, Fiscal Affairs remains optimistic that this program or a substitute will be made workable through the joint efforts of personnel of that department and the many dedicated employees of the Commonwealth who are striving under an awesome burden.

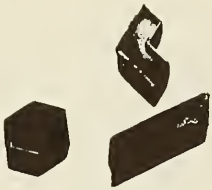
While patient income as managed by Fiscal Affairs attempts to cover the operating expenses of Children's, the hospital looks elsewhere for funds to expand. This effort is the responsibility of the Department of Resources and Development, which has reported slightly more than three million dollars received during fiscal 1970 from private sources. Bequests amounted to $695,000, with the remainder coming from individuals, foundations, and corporations. Our gratitude for this magnanimous support bears repeating.

The response to our annual appeal, coupled with private requests, allow Children's to strengthen existing programs, renovate outmoded facilities, and attract senior scientists from the disciplines basic to pediatric medicine. If we are to maintain our leadership role as one of the outstanding pediatric medical centers of the world, we must depend upon the continued generosity of those who have given in the past, and, in addition, attract new friends.

The generosity of old friends made our new Laboratories for Pediatric Research possible, and in preparation for its opening last Fall, the Office of Research Administration was created in 1969 to consolidate and standardize administration of research and training activities. Within a few months a Research Committee was established by the Staff Executive Committee. The 19 members of the Research Committee have responsibility for review and approval of all research protocols developed by staff in which medical center facilities are to be used. In addition, the Committee reviews and evaluates requests for research space, distributes General Research Support funds, and assists in program development and evaluation.

The single element that makes everything happen at CHMC is people. Doctors, nurses, technicians, aides, guards, carpenters, electricians, housemen, secretaries, clerks, cooks and bakers; more than 85 different categories of people make Children's operate. The cooperation of the medical staff is, of course, absolutely vital; and Children's is fortunate in having a staff that not only recognizes the contributions of those in other disciplines in the hospital, but works harmoniously with them. Just as it would be impossible to render effecitve medical care without the in-put of these hundreds of employees, so too the responsibilities of Administration could not be met without the very significant help of our staff of physicians.

Making patient care happen the way it should is the responsibility of every individual at Children's; a responsibility recognized and carried well by the 2900 people of The Children's Hospital Medical Center.



Department of Anesthesia

Robert M. Smith, M.D.

The Anesthesiology Service has shown continuing development, with activity increasing in numbers of patients anesthetized, in consulting service, and in teaching, research, and participation in hospital organization through various committees.

The Anesthesia Staff consisted of five physicians through December 31, 1970, at which time Dr. John Adams, after ten years of very valuable contribution, resigned to become Chief of Anesthesia at Children's Memorial Hospital, University of Alabama in Birmingham. To replace Dr. Adams, Dr. Jean Babineau joined our group in March, and Dr. Kate Sewall will be added as a sixth member in June of 1971. Both have had special training in pediatric anesthesia and neonatology. During 1970 we added a second nurse anesthetist, Miss Grace Hickey, C.R.N.A. to our staff. Throughout the greater part of 1970, our full-time staff consisted of the following:

Robert M. Smith, M.D.
Dean Crocker, M.D.
Louis S. Robbins, M.D.
Carol H. Johnson, D.M.D.
Sylvia A. Cropper, C.R.N.A.
Grace A. Hickey, C.R.N.A.

The clinical care of patients has been particularly successful during the past year due to several factors, including the addition of new anesthetic agents and combinations of agents, better methods of monitoring childrens' vital functions during and after anesthesia, and the most important factor of the continued growth and skills of the staff personnel.

The explosive agents ether and cyclopropane have almost entirely been replaced by non-flammable anesthetics, thus reducing to a minimum both the hazard of explosion and many details of explosion prevention. Newer agents including Innovar and Ketamine, and combinations of thiopental, morphine, and relaxants are being used more extensively, and can be tailored to suit numerous different situations presenting such special problems as severe cardiac enlargement, prematurity, or the presence of intercurrent respiratory infections. Halothane, despite rare complications, remains by far the most practical and versatile agent for pediatric anesthesia.

Especially helpful has been improvement in monitoring devices. During the past year temperature, blood pressure and cardiac monitors have been refined considerably, and enable the anesthesiologist to control patients with much greater accuracy and safety.

The Recovery Room, adjoining the Main Operating Room, remains a responsibility of the Anesthesiology Service. The anesthesiologist in charge of the operating floor each day acts as supervisor of Recovery Room, providing respiratory and other emergency care, and checking out all patients before their discharge to Nursing Divisions. Dr. Dean Crocker continues in his essential post as Director of Respiratory Therapy. His report appears as a supplement later.

Several improvements in our teaching program have taken place. The American Medical Association in 1969 first acted to allow specialty hospitals such as ours A.M.A. approval for a third-year residency in anesthesia. Our application was filed and the first inspection completed and passed in December, 1970. Final approval will considerably facilitate our Third-Year Residency program.

During 1970 our Residency Program was expanded by adding a fourth Third-Year Resident. Thus, with the five Second-Year Affiliate Residents, a total of nine residents is our regular paid quota, to which we can add more residents if on non-salaried basis. All Third-Year Residents now spend a three month term in Respiratory Therapy with Dr. Crocker. This has proved of great benefit to patients, resident and hospital.

The regular Tuesday Resident Conferences have continued, and in addition we have held Thursday morning clinical conferences, Wednesday afternoon complications meetings, and a monthly residents' seminar held at the homes of the Anesthesia Staff. All of these have been well attended and enthusiastically supported. In addition our residents attend seminars and conferences programmed by other Harvard Medical School hospitals.

In April, thanks to a grant from Merck, Sharp & Dohme, we were able to invite Dr. Jackson Rees, of Liverpool to be our first Visiting Professor in Anesthesia.

All members of our staff participate in teaching of residents, nurses and students in the hospital programs, and in addition to many outside speaking engagements a number of publications came from our department during the past year, listed in the back of this volume.

Research

Although our primary effort has been in the direction of clinical teaching, some efforts have been made in clinical and laboratory investigation. As a participant in the Harvard Anesthesia Grant, our department has studied potassium metabolism in relation to anesthesia and blood transfusion. This work was carried out by Drs. Johson and Smith. Dr. Adams, in association with surgeons Filler and Eraklis, and chemist Das, has uncovered interesting information concerning calcium chloride and calcium gluconate when used for cardiac stimulation. Next year Dr. Johnson plans to study tissue acid-base changes during anesthesia, using a new implantable electrode. This device has been under trial principally in our hospital, under Dr. Robert Filler who has used it to monitor infant's response to surgery during highly stressing operations.

Respiratory Therapy Service Report

Respiratory Therapy has evidenced a tremendous growth both in services to patients and in the teaching of students. The Harvard Teaching Hospitals-Northeastern University third-year program for the training of registered inhalation therapists has now 279 students. During this year 37 third-year students finished their "internships" at The Children's Hospital Medical Center, following rotations to Massachusetts General Hospital, Peter Bent Brigham Hospital, and the Beth Israel Hospital.

At CHMC 38 senior nursing students completed their affiliation in the department of Respiratory Therapy. Nursing in-service education on a programmed basis for continuing education was expanded to a bi-monthly basis.

A senior resident position in Respiratory Therapy was established during the year to provide immediate consultation on respiratory problems. Regular rounds seeing all patients suffering from respiratory difficulties is provided on a continuing basis. Methods of management in conjunction with the Medical Service, Surgical Service, Orthopedic Service, Ear, Nose, and Throat Service, and others utilizing the "team" approach are worked out.

During the past year medical students from both Harvard Medical School and Tufts Medical School elected educational rotational opportunity in Respiratory Therapy at CHMC. Rotation programs from other teaching hospitals were developed to allow respiratory therapy students to participate in pediatric training. Rhode Island Hospital, St. Vincent's Hospital in Worcester, Springfield Hospital, Yale-New Haven Hospital, as well as foreign trainees have profited in this endeavor.

Continuing education for departmental members is organized on a regular basis. Specialized courses related to respiratory therapy are provided at nearby teaching institutions.

The Department, during this past year, provided the field with a published text covering all aspects of respiratory therapy. In this fascinating new field, texts are needed to provide a working baseline of standards.

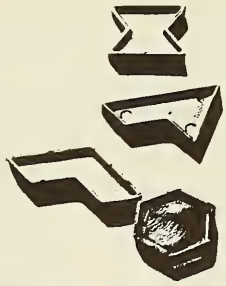
Research programs in conjunction with the Massachusetts Institute of Technology as well as with engineering staffs of industry, resulted in exciting developments in both the adaptation of infant ventilators and the respiratory administration of drugs. Professor Edward W. Merrill of Massachusetts Institute of Technology, Professor Leon Arp of Virginia Polytechnic Institute, as well as Dr. Steven Bell of the Bennett Corporation, were key figures in this research.

Dr. Oswaldo Villalobos of Maracaibo, Venezuela, Dr. Jesmond Birkhan of RamBam Hospital, Haifa, Israel, and Dr. Felicizano Silva of Hospital Infantil de Mexico spent several months in the Department learning techniques for use in their home hospitals.

Development of emergency transportation techniques for newborn infants was established in association with Dr. James Drorbaugh of the Medical Service. Dr. Herman Carr of CHMC in conjunction with Respiratory Therapy initiated a program of respiratory care as well as emergency techniques for all CHMC employees. New sterilization procedures for equipment were also developed in coordination with Surgical Research.

Respiratory Therapy Statistics

Patient Care Days	21,972
Patients on Total Ventilatory Support	1,561
Patients on Controlled Temperature	914
Patients Receiving Resuscitation	212
Patients on Life Support Systems	11,592



Department of Cardiology

Alexander S. Nadas, M.D.

In October 1969 the Staff Executive Committee, with concurrence by the Trustees of the Hospital, established Cardiology, up till then a Division of the Department of Medicine, as an autonomous Department.

The reasons were almost entirely administrative, recognizing the size of the operation. Cardiology, from its beginnings in 1949, when its entire fulltime staff consisted of the present chief and a lone electrocardiographic technician, grew to a large group with 11 full-time staff members, 14 fellows, and over 30 technicians and secretaries. Twenty years ago we had one small cardiographic laboratory on the 4th floor of the A Building, taking and processing electrocardiograms and an occasional phonocardiogram (heart sound tracing). Today we operate two cardiographic laboratories (one in Building A and one on the 5th floor of the Fegan Building), two catheterization laboratories (one on the 2nd floor of the Farley Building, next to Radiology, and one in the subbasement of the Fegan Building in the vicinity of the Hyperbaric Chamber), one Pathology laboratory (in the basement of the Bader Building), one embryology laboratory (on the 12th floor of the G Building), one basic physiology laboratory (1st floor of the Carnegie Building) and a pulmonary laboratory (in the House of the Good Samaritan). Twenty years ago there was one cardiac clinic a week, on Thursday afternoons attended by 10 or 15 patients. This year we have clinics every afternoon on the 5th floor of the Fegan Building with 75 to 100 visits per week (the total number of outpatient visits, 3,260). The Senior Staff sees an additional 20 to 25 patients per week in our private office. The activity of our impatient operations may perhaps be best assessed by stating that in the last calendar year 470 cardiac catherterizations were performed in our laboratory. There were no cardiac catheterizations performed in this hospital before 1950.

These few vital statistics, then, indicate why it seemed wise to establish Cardiology as a separate Department. It was getting too big to be administered by the Department of Medicine, particularly since that Department itself was growing at a very rapid rate as described in Dr. Janeway's report. One other, conceptual reason should be brought up justifying the establishment of Cardiology as an autonomous Department. Dr. Sidney Farber some years ago suggested, and the Executive Committee of the Staff as well as the Trustees supported, a move to establish a Cardiac Center within The Children's Hospital Medical Center that would bring under one umbrella the various services engaged in care, teaching, and research concerning heart diseases of children. With the establishment first of a Department of Cardiovascular Surgery and now one of Cardiology, this idea, aiming at a coordinated, multidisciplinary approach, has come nearer to realization.

A note of caution should be sounded here, lest this establishment of separate departments would lead to fragmentation of well-established disciplines. The fact that the Cardiology Staff is still a member of the Department of Pediatrics at the Harvard Medical School assures an optimal type of operation allowing maximal flexibility in daily management, pursuance of individual goals, establishing contacts with other disciplines engaged in Cardiology, but all, still, within the general framework of Pediatrics. It is particularly important to maintain this contact from the training point of view, since the Pediatric Board examinations require rather thorough familiarity with Pediatric Cardiology, and the Pediatric Cardiology Sub-boards have as one of their requirements training in general pediatrics. In effect, then, Cardiology is not breaking away from Medicine; it stays with it as part of a federation gaining support from it and, through its own alliances with surgery, pathology, physiology, etc., adds new dimensions to Pediatrics.

Patient Care

The activities of the Department may, perhaps, be best shown by summarizing the output for the first fiscal year of our independent operations:

Number of Electrocardiograms	4,936
Number of Phonocardiograms	310
Number of Catheterizations	465
Number of Clinic Visits	3,260
Number of Patient Days on Division 35	9,816

One should emphasize here one aspect only among the many interesting developments in the care of children with congenital heart disease, namely, our increasing preoccupation with very young babies.

The number of catheterizations performed yearly in our laboratory over the past five years, including a list of those performed on babies under one year of age, is indicative:

Year	Total Caths	Infant Caths
1965	394	111
1966	419	101
1967	490	118
1968	585	128
1969	557	164
1970	477	161

This trend is based principally on the following facts: First of all, surgical techniques have become available for the treatment, or palliation, of at least three quarters of the babies with clinical heart disease. Secondly, diagnostic techniques, particularly cardiac catheterization, have achieved a high degree of accuracy and safety so that there is no baby too young or too sick to undergo diagnostic studies today. Finally, as other excellent cardiac units were developed in New England, the Children's Hospital was asked to undertake increasingly the care of the sickest, the youngest, the most fragile babies that no other unit felt that they could tackle safely. The availability of highly skilled medical and surgical personnel, as well as very specialized equipment, 24-hours a day, seven days a week, helped this become a highly successful operation, allowing for a 70 percent salvage rate of all babies ill enough to be catheterized under one year of age.

The importance of the effort aimed at the salvage of babies with critical heart disease was recognized by the Children's Bureau of the Department of Health Education and Welfare by the establishment of the Regional Infant Cardiac Program in April, 1969. Administrative headquarters are at Children's, headed by Dr. D.C. Fyler, Associate Chief of Cardiology, and Associate Professor of Pediatrics at the Children's Hospital, Harvard Medical School. Eleven centers are cooperating in this program, covering all the New England states, and giving care to sick babies with heart disease. The program assists the individual States with education programs, transportation, communication and maintenance of meaningful statistics. The goal is to establish a regional program allowing everybody with heart disease born in New England to get the most up-to-date medical and surgical care available anywhere in the world. This seems like a reasonable goal, nearing realization.

New England Cardiac Centers participating in the Regional Infant Cardiac Program include:

Connecticut	Hartford Hospital
	St. Francis Hospital
	Yale-New Haven Hospital
Massachusetts	Boston City Hospital
	Tufts-New England Medical Center Hospitals
	Children's Hospital Medical Center
	Massachusetts General Hospital
Maine	Maine Medical Center
New Hampshire	Mary Hitchcock Hospital
Rhode Island	Rhode Island Hospital
Vermont	Medical Center Hospital of Vermont

Training

The Cardiology Department has been training academic pediatric cardiologists since 1950. For the past 12 years this program has been supported by a training grant from the National Heart Institute (now the National Heart and Lung Institute) of the National Institutes of Health. At the present time, 49 of our trainees are fulltime academic pediatric cardiologists in this country and abroad. We admit five new trainees into the program each year, all having completed their education in Pediatrics or internal medicine. They stay with us at least two, but very often three, years. Table IV lists the trainees in 1969 and 1970 and the present position of our graduates from July 1969 and July 1970.

Research

Our research effort is a multidisciplinary one, bringing together our clinical investigator with those whose research interests are within the basic sciences. Quite naturally the research staff holds appointments in the Cardiology Department of the Children's Hospital Medical Center and the Department of Pediatrics of the Harvard Medical School. Many are also members of other departments of the Hospital and the Medical School (Pathology, Anatomy, the Department of Epidemiology of the Harvard School of Public Health). These individuals are in close collaboration with individual research projects with members of other hospital departments and divisions (Surgery, Hemotology, Clinical Genetics, Psychiatry, etc.). Although the research effort is strong and productive, everyone of the investigators carries teaching responsibilities and almost all are engaged more or less in the care of patients.

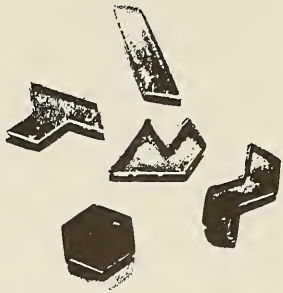
The list of scientific publications appearing in 1969 – 70 gives some measure of the research activities of the Department and mirrors accurately the multidisciplinary nature of the undertaking.

Support is derived principally for our Heart Research Program Project Grant administered by Dr. R. Grier Monroe, Associate Chief of the Cardiology Department and Associate Professor of Pediatrics at Children's Hospital, Harvard Medical School. Other grants from the National Heart and Lung Institute, the Massachusetts Heart Association and the General Research Support Grant of the Children's Hosptial Medical Center also contribute to the support of our operations.

In this period of general retrenchment within the scientific community no major expansions are planned. The beautiful plans of a combined outpatient care and clinical research area have been shelved for an indefinite period, but will be resurrected in a happier age, we are confident.

Certain minimal steps of consolidation have to be taken within the immediate future, however, to hold the line and not let the whole enterprise falter. First of all, our two catheterization laboratories will have to be brought together for the sake of efficiency, and re-equipped to meet modern radiologic standards as well as the increasing demands by our surgical colleagues to furnish them with the most accurate diagnostic picture possible. Secondly, the regional efforts to organize and deliver optimal care to *all* children with heart disease in New England should be pursued with increasing vigor. Thirdly, diagnostic and surgical techniques focusing on the solution of the *most complex* problems at the *earliest* ages will have to be developed. Finally, in the laboratory, the etiology and morphogenesis of congenital heart disease will have to be pursued in depth with eventual prevention in mind.

With these relatively modest goals the Hospital will be able to maintain its leadership, established by Dr. Gross over 30 years ago. We cannot rest on our laurels. We have to continue to develop capabilities that will enable us to solve the most difficult problems in the field. We have the patients, most of the staff, and most of the equipment. Congenital heart disease is one of the most common causes of death in our patients. We must continue to develop the Cardiology Department as a strong, vigorous enterprise within the Hospital. We do not have to start a new development, but we cannot afford to let a thriving enterprise run down through inertia and lack of vision.



Department of Clinical Laboratories

Harry Shwachman, M.D.

This past year has seen considerable changes in the physical make-up of the laboratory. We no longer have a small, overcrowded work area but a very satisfactory, well equipped and well-lighted modern laboratory, with major construction involving the entire second floor area. Much of the new equipment in the chemistry laboratory is automated; the main items of new equipment consisting of an Atomic Absorption Spectrophotometer, Perkin-Elmer #402, a six-channel autoanalyzer and a #302 Perkin-Elmer ultraviolet spectrophotometer. We also have a glassware wash room with a relatively small capacity for production of distilled water. The area of the Hematology laboratory has also increased in size with three special rooms, one for coagulation studies, one for special tests, and one for housing the Coulter Counter. The laboratory area also has a small room for urine and feces analyses. In addition a convenient blood drawing room is part of the new set up. One room has been set up as a Sweat Testing Laboratory, and next to it is a waiting room which is used for patients referred for various tests, including sweat tests. Finally, one small room is available for Fellows and the Resident in Clinical Pathology.

During the long period of construction (over one year) the Hematology laboratory came under the direction of Dr. David Nathan when the research hematological procedures moved to the laboratory area and there was no separation and distinction between routine hematology and research hematology tests. This union strengthened the clinical laboratories. Dr. Laforet was designated as the Technical Supervisor of the hematology technicians.

One of the striking innovations was the setting aside of a large room for Lab Control, serving as a place for all specimens to be received, sorted and be properly redistributed. All records of tests are kept here, and reports of tests are made available through this room. Prior to this control center, technicians were constantly interrupted by calls from various physicians and others requesting answers to tests. Having all this information centralized and made available has provided more time for the technicians to perform their jobs without interruptions.

The Bacteriology laboratory is located on the second floor of the Carnegie Building and was completed the previous year. One of the great improvements in service was the institution of a more efficient messenger delivery service which operates on an hourly basis so that specimens reach the laboratory without undue delay. In addition there is a STAT messenger service which bypasses laboratory control and takes the specimens directly to the laboratories in cases where immediate analysis are needed.

In recent years, the Clinical Laboratory has grown to encompass the following: Clinical Chemistry, Clinical Bacteriology, Clinical Hematology, the Sweat Test Laboratory (Dr. Shwachman), Spectrophotometric Laboratory (Mr. Kopito), and various affiliated laboratories such as the Renal Metabolic Laboratory (Dr. Frank Fellers), the Endocrine Laboratory (Dr. John Crigler), the Virology Laboratory (Dr. Enders and Uxman), Research Hematology (Dr. David Nathan), Genetics Laboratory (Drs. Gerald Park-Gerald and Ellen Kang), State Laboratory, Department of Public Health for skin tests and various special tests done by the Communicable Disease Center in Chamblee, Georgia. We also use laboratories which are located outside the hospital for special tests. This includes the Robert B. Brigham Hospital, where antinuclear antibody tests are done and three stage latex fixation tests, and the Boston Medical Laboratory, where most of our tests for thyroid gland disorders are carried out. A new commercial clinical laboratory was set up in the city approximately two years ago, called Clin Chemistry Laboratory, which handles special tests for us, such as drug testing, including dilantin levels, barbituates, ceruloplasmins and other infrequently called for procedures for which we are not routinely set up to do.

The only laboratory receiving special mention in this report is the Spectrochemical laboratory, which, like all the other affiliated laboratories, is in part supported by hospital funds.

Spectrochemical Laboratory

The Spectrochemical laboratory was established in 1963 with funds from the National Institutes of Health. It specializes in analysis of metals and minerals in a great variety of materials, including biologic fluids, soft tissue, hair, nails, foods and beverages. The primary function of the Spectrochemical laboratory is to develop new diagnostic tests and perform known diagnostic tests in lead poisoning, Wilson's disease, thalassemia major, and cases of heavy metal toxicities. Routine patient monitoring during therapy with chelating agents is one of the services supplied by this facility.

The laboratory is equpped with various spectrometers, including atomic absorption and flame and ion-specific electrodes and participates in an extensive collaborative program with various departments within The Children's Hospital Medical Center as well as other institutions. Current projects include studies in genetics, male and female sterility, environmental health, cystic fibrosis, and screening for lead intoxication.

Personnel

The laboratory staff as listed in our time sheets includes 106 people. Thirty-five are in the Chemistry Laboratory, an equal number in Hematology, and 20 in Bacteriology. The expansion of the Laboratory Control area with a staff of five has provided more efficient delivery of specimens, reporting of results to the doctors, and also has prevented loss of income due to lost or inadequately prepared requisition forms.

The appointment of Mr. Terence Forde as the Laboratory Administrator has made it possible to deal more effectively with matters concerning our service function, purchasing of equipment, routine supplies and the numerous problems of personnel.

Many members of the laboratory staff have worked with Dr. Shwachman on a number of research projects, both basic and clinical. Our main activities deal with Cystic Fibrosis and other nutritional disorders, and also lead poisoning. Support for our work has been through grants provided by the NIH and the National Cystic Fibrosis Research Foundation, and our local Cystic Fibrosis Chapter. Those who are supported in part or in full by these funds include, Dr. Khaw, Dr. Antonowicz, Mr. Kopito, Dr. Rubino, Dr. Lloyd-Still, Dr. Holsclaw, Dr. Kraus, Dr. Mahmoodian, Mr. Tsutsumi, Elaine Rossen, Sin Kai Chang and part time secretarial assistance from Rose Levine, Ethel Fisher and Elgie Levin.

The number of tests performed in the major divisions increases about 10 percent each year, and currently stands at about 400,000. Changes in the charges of various tests were made after a number of important factors in cost determinations were considered. These included (a) the technical proficiency necessary, (b) the cost of equipment and materials used, (c) the time for performance of the test, (d) the volume of the test and (e) the charges made by other laboratories in the Boston area for a similar test.

In addition to his responsibilities to the Clinical Laboratories, Dr. Shwachman has increased his commitment to the Chronic Nutrition Clinic, to the training of Fellows. He has served as Visiting Physician for one month each on the Medical Service, the Division Clinical Research Center, and the North Shore Children's Hospital. As a member of the Medical and Scientific Council of the National Cystic Fibrosis Research Foundation and of the Medical Education Committee, he attended four meetings in New York City, and as a Consultant to the Chelsea Naval Pediatric Unit he provided four one-hour lectures during the year. He also participated in a number of conferences.

Department of Dentistry

Lennard T. Swanson, D.M.D.

During the last five years we have had to reorganize and consolidate time and again in order to accommodate our expanding activities. With the Medical Center engaged on so many fronts, we find that there are many opportunities for involvement and that these cannot be totally or arbitrarily separated from responsibilities that relate to the practice of dentistry in a hospital setting. As long as The Children's Hospital Medical Center endeavors to provide total health services for children, we must be prepared to provide dental care for at least that segment of the Hospital population whose special oral needs can best be handled here.

Crisis dentistry is one unfortunate characteristics of hospital practice. Patients come in needing extensive treatment, and once they have had the work completed disappear for extended periods until pain again forces them to seek attention with loss of teeth, resultant malocclusion, chronic discomfort, and greater costs frequent corollaries. Dire consequences can result when this same indifference is practiced by parents of children with, for example, hemophilia or severe heart disease. We earnestly solicit cooperation to insure continued optimal dental care. Patient and parent cooperation and understanding can only be achieved through demonstrated interest and education.

Teaching and Harvard

Additional strength has been afforded our department by the revitalization of the Harvard School of Dental Medicine under Dean Goldhaber's leadership. Of particular note is financial support which will enable the School to double its class size. This will also equip the Dental Department with four new operatories designed for "four-handed" dentistry, which will increase our total number of units to sixteen. Although these new units will be devoted to undergraduate and graduate teaching, primarily, they will also relieve a critical shortage of chairs since two chairs currently assigned to undergraduate teaching in the recently instituted externship program will be vacated.

A "Training Center for Clinical Scholars in Oral Biology" has also been established and funded at Harvard. This will enable the School to award a Doctor of Medical Sciences degree and has received enthusiastic support from the Medical Faculty.

Our participation has been solicited in the first module of Health Inc. Initially, dental care will be limited to children, with two dental operatories staffed by our residents. Additional clinical experience and a demonstration in opportunities for a public health approach to the delivery of dental care are anticipated benefits. Furthermore, it will hopefully clarify the potential role of dentistry in a primary care facility with ultimate modification of our clinical responsibilities within the Hospital.

Our teaching commitment in pedodontics within the Department includes three interns, three residents, four Fellows, as well as the entire senior class of undergraduate students who rotate through our service, two at a time. Since the latter require instruction and careful supervision, more formalized teaching input was required. Thus, five senior staff pedodontists have been assigned a day a week rotation, with their primary obligation being to instruct those at the various levels of training. The four orthodontists continue to be available for chairside consultation as well.

With elective time having been made available, residents in pediatrics have participated in a variety of clinical activities within the Department of Dentistry. This has proved to be a mutually beneficial venture. We encourage continued involvement, for the experience is far more beneficial than attempts have been in the past to familiarize our physician colleagues with the oral cavity through even the most carefully chosen lecture material.

Investigation and Research

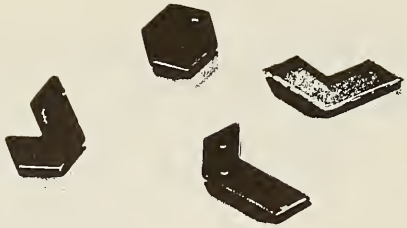
Working in conjunction with the Department of Plastic Surgery, growth documentation and development of new techniques for facial reconstruction clearly indicate exciting opportunities. More and more congenital anomalies appear amendable to corrective procedures. Our investigations seem to justify earlier intervention that these handicapped youngsters may not suffer unnecessary psychological trauma secondary to their physical defects. That accelerated progress be made, a more formalized program must be considered in the creation of a center for orofacial rehabilitation.

Despite the fact that we are firmly committed to surgical correction of defects, there are many complicated problems where structures must be replaced or augmented by prostheses. For this reason a prosthodontist has been added to our staff whose imaginative skills will add still another dimension to our services. Little attention has been devoted to replacement of missing teeth or the restoration of fractured incisors, let alone early optimum dental replacements for cleft palate patients whose own natural teeth must bear the extra burden of carrying replacements over a total lifetime. Technological developments in dental materials and laboratory procedures justify adaptation to the child population.

Within the Hospital, clinical investigations continue to be our chief contribution to this side of our academic responsibilities. This is so because no laboratory space is available to our dental staff in the entire hospital complex. With ever increasing commitments to the expanded graduate programs of the Harvard School of Dental Medicine it is essential that laboratory research now carried out by members of our staff in the badly overcrowded dental school building be moved to the environment in which they function. Laboratory research now in progress under Dr. Sweeney's direction fully justifies this input.

Paul K. Losch Teaching Fund

In September of 1969, Dr. Losch's retirement as Chief of Dentistry came to pass, but his productivity continues in his new role as Assistant Dean for Hospital Programs at the Harvard School of Dental Medicine. In tribute to the man who established the Department of Dentistry at The Children's Hospital Medical Center and nurtured and guided it so successfully for so many years, there was created the "Paul K. Losch Teaching Fund". Regrettably, the economic climate for fund raising was so unfavorable in the year 1970 that a decision had to be made to postpone serious solicitation that those most indebted to Dr. Losch for his teaching and council could meaningfully express their regard for him in a tangible manner. Though his presence is missed, the principles for which he stood will continue to guide this Department as we look to the future with enthusiastic optimism.



Department of Medicine

Charles A. Janeway, M. D.

In the 1969 annual report of this department the final section stressed the goals and principles by which we hoped to guide our future development as The Children's Hospital Medical Center entered its second century of service to children. As a philanthropic institution we have a basic mission to provide the best possible medical care. But beyond that, as a teaching hospital intimately associated with a great medical school, we have a *unique* obligation to foster research upon those diseases for which the means of prevention or cure have not yet been found and to teach, in order to multiply the impact of the institution's work.

In discussing the goals of our research program, we stressed three broad areas of investigation in which we hoped to link the efforts of scientists and clinical investigators in a joint attack upon major health problems affecting children:

the causes and mechanisms of disease, for which, as yet, neither means of prevention nor cure have been found;

the delivery and quality of health and medical care, with particular reference to our cities (to which might have been added the rural areas and the developing countries);

the psychological development, learning and adaptation of children to society.

Similarly, the goals of our teaching program were outlined as follows:

to teach by example;

to foster the student's growth through the assumption of increasing clinical responsibility;

to teach not just facts and techniques, but to inculcate habits of critical thought and a problem-solving approach to each patient's needs;

to make our teaching as relevant as possible to the demands of society in the present and the future.

And finally, the principal means to reach these goals were considered to be dependent upon:

the ability to attract the best young people from all over the world into our training programs;

stabilization of the positions of the leaders in the various divisions of the full-time staff so as to give continuity to our major programs of research, teaching and patient care;

finding the additional resources necessary to provide the facilities and financial security for those leaders upon whom the quality of our work will always depend.

In the light of these goals and principles, it would seem worthwhile to look back and see how much, if any, progress has been made towards their implementation during the past two years. Statistics covering services to patients will be found in Tables I and II.

A. "The causes and mechanisms of disease for which neither the means of prevention nor cure have been found."

Table III, which presents data concerning mortality and the major causes of death on the Medical Service for the past five years, indicates where our lack of knowledge continues to result in failure to save life. During the past two years malignant disease, heart disease (almost entirely congenital heart disease), congenital malformations, including inborn errors of metabolism, diseases of the newborn, and infections accounted for approximately 90 percent of the deaths among medical patients. When one appreciates that most of the deaths from heart disease are the result of congenital malformations of the heart, that many of the deaths in the newborn period are related to the presence of congenital anomalies or infection, and that many of the patients with malignant disease die of complicating infections, it is clear that basic knowledge concerning the causes of malignant change in the cell, the pathogenesis of congenital malformations, and the interactions between invading microorganisms and the defenses of the invaded host must be obtained if we are ever to prevent the majority of deaths in hospitalized children.

What is being done? The massive and well-organized multidisciplinary attack upon the problem of cancer being carried on under Dr. Farber's direction in the Children's Cancer Research Foundation provides the greatest hope with regard to malignant disease. But other laboratories in the Hospital are also working on special aspects of the cancer problem. Dr. Merler of the Division of Immunology brought his chemical talents to bear upon some brilliant observations of Dr. Folkman that the growth of a tumor was dependent upon the induction of a sufficient network of blood vessels to support its growth. Working with Dr. Folkman, Dr. Merler has been able to isolate and characterize a substance produced by the tumor cells which will induce rapid growth of blood vessels.

Another research team consisting of Dr. Rosen, the Chief of the Immunology Division; Dr. Nathan, the Chief of Hematology; and Dr. Levey of the Department of Surgery, has been working patiently and meticulously upon the transplantation of bone marrow cells from immunologically compatible relatives to patients with severe life-threatening immunologic deficiencies or aplastic anemia, in the hope that our techniques and understanding may some day reach a sufficient degree of perfection to permit their trial in the treatment of certain patients with leukemia or hereditary disorders of the blood-forming organs. Science knows few departmental boundaries, and progress in medical research depends upon combining the deep insights and technical sophistication of the basic biomedical scientist with the close observations and critical evaluations of the experienced clinical investigator. The fact that many of our research programs have, during the last months of 1970, moved from overcrowded temporary laboratories into the beautifully planned quarters in the new Pediatric Sciences Building, which was specifically designed to promote the interplay between basic scientists and clinical investigators from various departments, augurs well for the future progress of research at The Children's Hospital Medical Center.

In the field of congenital heart disease, Dr. Nadas has been able to put together a very strong multidisciplinary team, comprised of investigators skilled in the approaches of anatomy, embryology, pathology, physiology, and biometrics to the problems of the heart and the circulation, and their collaboration with a highly skilled group of clinical cardiologists, clinical physiologists, radiologists, and cardiovascular surgeons is steaily improving the outlook for the large number of children born with congenital cardiac defects. In fact, the Division of Cardiology has grown so large and so strong that, during the past year it was made an autonomous department within the Hospital, although its members with clinical interests remain members of the Department of Pediatrics in the Medical School. It is a source of considerable satisfaction that three different clinical disciplines--Psychiatry, Neurology and Cardiology--which received their start in the Department of Medicine have grown and prospered to the point of achieving independent departmental status during the past 18 years.

TABLE III **MORTALITY-MEDICAL SERVICES**
Comparative Figures (Past 5 Years)

Year	*1965-66*	*1966-67*	*1967-68*	*1968-69*	*1969-70*
Admissions	3,878	3,673	3,780	3,827	3,880
Deaths	243	211	228	238	224
Mortality	6.6%	5.8%	6.1%	6.2%	5.8%
Post-Mortem Exams	85%	89%	85%	87%	83%
Major Causes of Death					
1. Neoplastic Disease	24%	39%	39%	32%	38%
2. Heart Disease	18%	20%	21%	22%	13%
3. Other Congenital Malformations	14%	15%	19%	15%	15%
4. Diseases of the Newborn	7%	9%	11%	14%	15%
5. Infection	10%	13%	12%	7%	6%
6. Trauma				2.2%	2.5%
7. Miscellaneous and Unknown	24%	17%	13%	5.8%	7.5%

The problem of the cause, and hence prevention, of congenital malformations and the related problems of the recognition and control of inborn errors of metabolism is a tremendously challenging one, which cuts across every discipline of medical science and clinical care. It has been known for many years that specific malformations could be produced in the offspring of experimental animals by various chemical or nutritional stresses applied to the mother during the early phases of pregnancy when embryological development of the fetus is occurring. That these experiments have their human counterparts has been proven by the thalidomide tragedy and the recognition of the multiple anomalies in babies born to mothers who had german measles (rubella) during the first trimester of pregnancy. Some malformations are inherited, as are the inborn errors of metabolism, while others arise as a result of abnormalities in the rearrangements of the 23 paired chromosomes, found in normal human cells, incident to the maturation of the ova and sperm or in the early cell divisions following fertilization. Study of the chromosomes by biologists has gone on for many years, but cytogenetic studies of human cells has only begun in the past 15 years.

During the latter phases of his distinguished career, Dr. Louis K. Diamond foresaw the coming importance of the field of human genetics and persuaded one of his ablest younger colleagues, Dr. Park Gerald, to take a year of training in the Galton Laboratory with Professor Penrose at University College in London. Since his return, Dr. Gerald has become a leader in the field of human genetics in this country and has had major responsibility for organizing its teaching at the Medical School. With the help of Dr. Diamond, the Hospital created laboratory facilities for cytogenetic and biochemical genetic studies in the former Ida C. Smith building, the last remnant of the original ward pavilions of the Hospital. Although fearfully overcrowded, these laboratories served well until this year. Now, with the move into spacious new laboratories on the fifth floor of the Pediatric Sciences Building, the Division of Clinical Genetics can add the scientific strength necessary to mount a much more effective attack upon the problem of congenital malformations and the genetic aspects of mental retardation.

In no field is the relation of the basic research to clinical practice and the great social questions of our time more evident. Present day techniques, which permit the recognition of abnormalities of cells, either morphologically or biochemically, make it possible to study cells shed by the human fetus by aspiration of amniotic fluid from the mother's pregnant uterus, and to determine whether or not that fetus has a particular genetic disease. Thus, prenatal diagnosis is possible. An obvious consequence is the possibility of therapeutic abortion to prevent the birth of a handicapped child. Thus, a growing number of hereditary diseases, previously considered to be the blows of an unkind fate, are now preventable. In some of the inborn errors of metabolism, early recognition by biochemical tests before symptoms appear may make it possible to avert or modify the disease itself. This is true in the case of phenylketonuria (PKU) and some of the antibody deficiency syndromes (congenital agammaglobulinemia). Through collaboration with the Boston Hospital for Women, the addition of new scientific colleagues, Drs. Richard Davidson and Gail Bruns, with their specialized interests, to his laboratory group, and of a skilled clinician, Dr. Thomas Cone, to his team, Dr. Gerald's division is now able to push forward with basic studies in the field of genetics and at the same time to see that the rapid scientific advances in this field are made available for the diagnosis, prevention and treatment of genetic diseases and for the counseling of parents of children with congenital malformations in both Children's and the Boston Hospital for Women.

It is in the field of diseases of the newborn, that recent research progress has been least impressive, despite the many contributions of Dr. Blackfan, Dr. Clement Smith, Dr. Stewart Clifford and Drs. Diamond and Allen of this Department to neonatal pediatric care in the past.

Although exchange transfusion developed by Diamond and Allen for the treatment of hyperbilirubinemia has virtually eliminated deaths from kernicterus and its sequel, the athetoid form of cerebral palsy, nevertheless mortality from the respiratory distress syndrome (hyaline membrane disease), a major cause of neonatal death, has changed but little. Moreover, with the breakdown of health services in our central cities, and a marked rise in illegitimacy, the incidence of premature birth has nearly doubled, and, with it, there has been both a higher infant mortality and an increase in such later morbid sequellae as spastic cerebral palsy and other neurological manifestations of brain damage. A vigorous attack upon this complex of economic, social, public health, obstetrical and pediatric problems is planned, and an *ad hoc* committee is searching for a Professor of Perinatal Pediatrics who can provide new leadership in this vitally important field.

TABLE I **MEDICAL AMBULATORY SERVICES**
Visits to Clinics

	1946-47	*1956-57*	*1966-67*	*1968-69*	*1969-70*
Family Health Division	———	2,839	4,308	3,148	4,639
General Medical OPD (Children	13,470	7,701	5,677	10,847	9,296
Adolescents' Unit	———	4,807	7,801	5,509	4,980
Special Medical Clinics	10,890	10,057	15,285	16,753	17,307
Emergency Clinic	———	5,506	41,631	43,936	51,301
TOTAL VISITS (Medical)	24,360	30,910	74,702	80,193	87,523
TOTAL VISITS (All Services)	———	———	154,697	172,350	185,204
Percent Medical Visits	———	———	48.5%	46%	47%

Infections remain the most common cause of illness and a frequent cause of death in children, and are often an important contributing factor to mortality from congenital malformations and malignant diseases. There are a large number of children, in whom one or more of the mechanisms of defense against infection are deficient, either from inheritance, or as the result of the therapeutic measures used to treat their primary disease, so that either the usual infections of childhood are unusually severe or repetitive, or microorganisms which do not normally cause disease become pathogenic. In this broad area of research, this institution continues to be extremely active. The Research Division of Infectious Diseases under Dr. John Enders, which has made so many outstanding contributions to pediatrics over the years, will soon be moving to the Infectious Disease floor at the top of the new Pediatric Sciences Building. This will bring together the Virology group, under Drs. Enders and Oxman, whose research interests have turned primarily to the ways in which viruses induce malignant transformation in cells, with the members of the clinical Division of Infectious Diseases, led by Dr. David H. Smith. This group is concerned with bacterial infections and the clinical management and control of infectious diseases in the Hospital.

Dr. Smith himself has played a leading role in this country in the study of the important phenomenon of the transmission of resistance to antimicrobial drugs from one bacterium to another by so-called "R factors." This phenomenon is primarily responsible for the rapid increase of drug-resistant strains of bacteria in hospitals. Dr. Smith has recruited a very able group of associates--Dr. Pierce Gardner who serves as principal consultant and infection control officer for the hospital, Dr. Arnold Smith, who is applying his knowledge of biochemistry, pathology and pediatrics to a study of the mechanisms of infection, and Porter Anderson, Ph.D., a biochemically trained microbiologist. The latter, working with Dr. Smith, has succeeded in isolating and purifying the capsular polysaccharide from *Hemophilus influenzae b,* one of the major pathogenic bacteria and the cause of the majority of cases of purulent meningitis in childhood. This work is part of a broad research effort aimed at development of a vaccine to eliminate this infection as a cause of death and neurological damage in infancy.

The field of immunology concerns itself with the processes whereby the body defends itself against infection; these processes may be deficient, giving rise to unusual susceptibility to infection or may become distorted so as to produce disease in the host ("autoimmune disease"). Basic understanding of the immunological differences between individuals and of the ways in which their immune responses can be controlled is absolutely essential to successful organ or cell transplantation from one individual to another. Over the year, this department has been one of the leading centers for the study of immunological deficiency diseases. The Immunology Division, vigorously led by Dr. Fred Rosen and Ezio Merler, Ph.D., in its new laboratory quarters, with the addition of Dr. Harvey Colten from the National Institutes of Health to its staff, and working in close collaboration with Dr. Raphael Levey of the Department of Surgery, is attacking the fundamental problems of transplantation.

B. "The delivery and quality of health and medical care, with particular reference to our cities."

Initiation of the Family Health Care Program in 1955 under Harvard Medical School auspices, in space provided by this Hospital and with leadership from members of our medical staff, created a field laboratory for medical teaching and research in the community. By 1963, the program had become sufficiently well-established in its service and teaching components to permit the establishment of a Medical Care Research Unit, directed by an experienced sociologist, John Kosa, Ph.D. A carefully designed experiment was planned, carried out and analyzed over the next five years. This controlled study of the effects of providing comprehensive, continuing, family-focussed health care by a health team, consisting of physician, nurse and social worker, on the health, health attitudes and utilization of medical facilities for the care of their children by urban poor families has provided a great deal of useful basic data for future planning of health care programs in our cities. "In sum, these data indicate that comprehensive pediatric care is more efficient and less costly to the patient in time, money, and dissatisfaction than is the fragmented care typical in the welfare medicine system for the urban poor. However, some subpopulations did not benefit as well as others from comprehensive care. Ways must be found to integrate the services of public welfare and other agencies such that the policies, formal and informal, of such agencies do not work at cross purposes with comprehensive medical care programs."

Research in other aspects of community health needs and health care has also been carried on by Dr. Eva Salber and Dr. Robert Rosenberg, the first and second Directors of the Martha Eliot Family Health Center in Roxbury, by fellows in the Family Health Care Program and by certain members of the house staff, who have been deeply interested in the problems of ambulatory pediatrics and the improvement of health services.

The availability of Mr. Kopito in the Division of Clinical Laboratories as an expert in the use of the atomic absorption spectrometer in the measurement of metals in biological materials, has enabled him and Dr. Shwachman to study hair samples from ghetto children for the presence of lead. The data they have obtained in surveys of groups of children indicate that, whereas cases of clinical lead *poisoning,* though still occurring too frequently, are relatively uncommon, the number of children who have had appreciable lead *exposure* is many times larger. Since such children are potentially at risk of developing clinical lead poisoning under proper circumstances, the magnitude of this serious public health problem in our core city has thus been revealed.

C. "The psychological development, learning and adaptation of children to our society."

A vast amount of frustration and unhappiness in our society results from lack of consonance between the hopes of parents for their children and their actual physical prowess, intellectual performance, and social adaptation. To deal successfully with the increasing importance of these problems in pediatrics, as life threatening disease become less common, child health workers must have new tools--better methods of assessing the inherent potential of the individual, of measuring actual developmental performance and of guiding the changing relationships between the growing child and those who represent society--his parents, his teachers, and officials of government and the law. Pediatricians in the past have dealth with these problems on a purely empirical basis. But with the increasing sophistication in the behavioral sciences, a growing body of knowledge of child development, and the unwillingness of parents to accept such statements as, "he'll grow out of it" or "she was born that way; there's nothing to be done," and institution such as ours must recognize the critical importance of research and teaching in these fields of child development, learning and social adaptation.

During the past few years a number of programs, most of them multidisciplinary, have indicated a trend toward more intense involvement of the Hospital in this area of high morbidity but low mortality. One life-threatening disturbance of social adaptation is the syndrome of child abuse. Collaborative studies by representatives of the Department of Social Service, Psychiatry and Medicine indicated that our performance in the recognition and management of these unfortunate children was far less than optimal. This in turn has led to the formation of a hospital committee to coordinate the work of all services and improve our performance and to the development of a community-wide plan to involve the various hospitals and official agencies concerned with this problem. The Department of Social Service, Dr. Lendon Snedeker of the Administration and certain members of our Department and the Department of Psychiatry deserve the credit for these efforts. We have been fortunate to have a resident, Dr. Eli Newberger, who is taking his public health degree at Harvard, available to work intensively on this problem.

The increasing involvement of Dr. T. Berry Brazelton, as Coordinator of Patient Care, in teaching child development and interdisciplinary management of children through patient care conferences and through the creation of a unit for the care of children with psychosomatic disease on Division 72, greater integration of the staff and fellows of the Adolescents' Unit into the activities of the Medical Service, and the close team work of doctors, nurses and social workers in the intensive care nursery at the Boston Hospital for Women has given our house officers much greater awareness of the extent to which psycho-social problems complicate the management of many children for whom they must care.

The multidisciplinary aspects of the care of handicapped children are made abundantly clear to those who participate, with Dr. Berenberg, in the Cerebral Palsy Clinic or with Dr. Allen Crocker and his group in the Developmental Evaluation Clinic for mentally retarded and multiply-handicapped children. And finally, tribute must be paid to Dr. George Gardner and the Department of Psychiatry for the splendid way in which they have collaborated with our Department in service to patients and in teaching since he organized the Department in 1953.

Unfortunately, research in these psycho-social areas has tended to lag considerably behind the development of programs of service and teaching, and we still have a lot to do before we can provide truly well-coordinated diagnostic evaluation and educational consultation to the large numbers of children with learning disabilities who exasperate their parents, trouble their teachers, and puzzle their physicians. Perhaps the most hopeful portent of a vigorous research effort in the complex field of psycho-social development and adaptation is the appointment of Dr. Julius Richmond, who has been a Professor of Pediatrics and a leading investigator in this field, as Professor of Psychiatry and Human Development at the Harvard Medical School and as Psychiatrist-in-Chief of the Children's Hospital Medical Center and Director of the Judge Baker Guidance Center.

TABLE II **IN-PATIENT SERVICES**

	1946-47	*1956-57*	*1966-67*	*1968-69*	*1969-70*[1]
Short-Term Divisions*					
Admissions	2,261	2,917	3,527	3,545	3,534
Hospital Days	33,926	26,484	35,315	34,389	33,608
Average Stay per Admission (Days)	15	8.4	10	9.7	9.5
Long-Term Divisions*					
Admissions	464	253	146	282	346
Hospital Days	32,692	20,757	6,801	5,905	5,580
Average Stay per Admission (Days)	70	82	47	20.9	16.1
TOTAL MEDICAL ADMISSIONS**	2,725	3,007	3,673	3,827	3,880
TOTAL ADMISSIONS ALL SERVICES			12,133	12,153	12,379
PERCENT MEDICAL				31.5%	31.3%
TOTAL HOSPITAL DAYS (MEDICAL)**				39,974	38,562
TOTAL DAYS (ALL SERVICES)			111,404	108,892	108,309
PERCENT MEDICAL				36.7%	35.6%

**These statistics kept by Nursing Divisions, not by Service*
***Statistics for Medical Service patients on all Nursing Divisions*
[1] *Figures include Cardiology, which became a separate department during year*

One multidisciplinary research effort in child development is the collaborative study, organized under the auspices of the Perinatal Research Branch of the National Institute of Neurological Diseases, Blindness and Stroke to follow prospectively the outcome of 50,000 pregnancies and to determine whether or not eventual psychological and neurological handicaps discovered in the child could be correlated with prenatal, perinatal and postnatal events. The Harvard component of this collaborative study was the largest in the country. The Boston Lying-in Hospital group, led by Drs. Stewart Clifford and William Cochran of our department and Dr. Luke Gillespie of the Department of Obstetrics, have completed their work, but the Children's Hospital group originally organized by the late Dr. Richmond Paine and now under Dr. James Drorbaugh and Dr. Dorothea Moore, is nearing the end of the seven year follow-up period. This huge study has accumulated a vast amount of data, much of which still remains to be analyzed, but our own preliminary data indicate quite clearly the extent to which low birth weight babies are at special risk.

Teaching

A. "To teach by example."

It is essential that the staff set the best possible example of patient care as a role model for students to emulate. We believe that this hospital has maintained a tradition of outstanding care through the years, but we cannot be complacent. A major factor in successfully translating the ideals of the senior staff into day by day care of patients by the junior residents, interns and medical students is the caliber of the senior residents, who supervise their activities. We have been fortunate in attracting an outstanding group of senior residents to the Service, and in addition have had the experienced and skilled services of Dr. Sherwin Kevy, as Assistant to the Physician-in-Chief, in immediate charge of the house staff, during a period of several years ending in 1968-69, and the enthusiasm and devotion of Dr. Frederick H. Lovejoy as Chief Resident in Medicine during 1969-70. To them goes much of the credit for setting the tone of the Service.

B. "To foster the students' growth through the assumption of increasing clinical responsibility."

Our student teaching and house officer training programs are designed to give as much responsibility to them as they can take for their patient, while at the same time maintaining sufficiently close supervision so that the child gets the best possible care. Such a program, under which both patients and house officers have tended to thrive, does demand a large number of residents and clinical fellows in the specialty areas; it is an important factor in the high cost as well as the excellence of care of seriously ill children in our hospital.

One of the refreshing aspects of the current revolt of the young is their keen interest in improving both the care of our patients and the quality of their own education. Through the House Officers' Association, they have not only planned their own series of teaching conferences, but have worked constructively with the staff to improve the organization of services to patients and to better their own training. These efforts have been very helpful to Dr. Berenberg, Dr. Adels and myself in strengthening their in-patient experience and to Dr. Cone and Dr. Alpert in reorganizing the Ambulatory services, so as to give better and more efficient care to patients and to emphasize the principle of continuity of care in their own training. Since most of our house officers will be engaged in hospital service and teaching activities during the rest of their professional careers, responsible participation in the planning, evaluation, and improvement of hospital programs is as much a part of their training as the actual care of patients.

C. "To teach not just facts and techniques, but to inculcate habits of critical thought and a problem-solving approach to each patient's needs."

This requires a constant, studied effort by the attending or consulting staff to take the time to make the student or house officer think through clinical problems. Having an excellent library, the gift of a generous anonymous donor on the seventh floor of the Farley Building, where most of our patients are housed, means that the opportunity to consult the medical and scientific literature is readily available. The give and take of daily ward rounds, the splendid teaching provided by the Radiology Department at X-ray rounds, and the informal discussions among students, house officers, fellows and senior staff at the heavily attended weekly Chief of Service Rounds all emphasize the critical, scientific analysis of clinical problems. This atmosphere is a far cry from the authoritarianism of much old world medical teaching and often surprises our foreign visitors.

D. "To make our teaching as relevant as possible to the demands of society in the present and the future."

To quote from Dr. Masland's report for the Adolescents' Unit, we are in a period "of violent upheaval spearheaded by three major groups--the young, the blacks and the poor." The war in Vietnam, racial and economic injustice, and inequalities in the distribution and quality of medical care are the principal targets of their complaints. Race, poverty, and poor medical care are certainly interrelated and the principal problems which concern the socially conscious young people in medicine. As regards race, the increasing numbers of black and Spanish speaking Puerto Ricans who come to our clinics emphasize the distressingly few minority group physicians and nurses on our staff. As a hospital, we are working with an interhospital committee which is attempting to recruit more applicants for house staff training from minority groups, particularly blacks.

The connection between race, poverty and lack of adequate medical care is clearly indicated by the figures for visits to the Emergency Clinic over the past 13 years given in Table I. Note that visits to the Emergency Clinic rose 8-fold in the ten years between 1956-57 and 1966-67 and increased by 5.5 percent in 1968-69 and by 16.8 percent in 1969-70, the latter in all probability a reflection of the enlarged space and greatly improved facilities opened early last winter. What these figures do show is that, while referrals to our appointment clinics have remained relatively constant during the past two years, the number of people turning to the Hospital for care of acute illnesses has continued to rise steadily because of the lack of physicians or around the clock medical services in the city. House officers and students are keenly aware of these deficiencies in the availability of health services and of the defects in the fragmented type of care offered in the Emergency Department. However, one great improvement has been the enlistment of the members of our part-time staff to teach house officers and students the care of children with common pediatric problems, in which they are much more experienced than most of the full-time staff. This arrangement has been a happy one for students, teachers and patients and perhaps, like our new facilities, has contributed to the increase in visits. Experience in the Emergency Clinic is highly relevant both to the future practice of the student and to the needs of society for better health care.

To offset the fragmentation of care, house officers assigned to the Ambulatory Services work on alternate days in the Emergency Clinic and in the Consultation Clinic upstairs, so they may have a patient who has been seen briefly in Emergency come to the Fegan Building the next day for a more thorough examination. Each house officer has one half day a week all year in Continuity Clinic, when he is encouraged to see patients for follow-up from his ward or out-patient service or to provide health supervision to the families he is caring for under the Family Health Care Program. Finally, to cut down on the long waiting time for appointments, a Medical Intake Clinic has been established, to which all self-referred patients are assigned as soon as they request an appointment. Here a house officer sees them briefly to ascertain the nature and severity of the problem and to arrange for more definitive disposal. In some instances it is possible to send the patient home without the necessity of elaborate and expensive studies. In others, the patient may be referred to Emergency Clinic, to the Medical Consultation Clinic, to a Special Clinic or returned to his own physician. These changes initiated by Dr. Cone and his two Chief Residents--Dr. John Graef and Dr. Roger Ashley--have greatly improved the care of our ambulatory patients and increased the satisfactions of the house officers.

Participation in the Family Health Care Program--either as a pediatrician caring for the children of several families in the community, or as a family physician caring for the whole family, throughout the year--continues to be elective, but the majority of house staff take part. House officers also are assigned to North Shore Children's Hospital and the Beverly Hospital, where, under the supervision of Dr. Barry Adels and the staffs of these community hospitals, they come much closer to the practice of pediatrics in the smaller cities of this country.

All of these activities owe their relevance to their focussing the attention of our house officers on pediatric problems in the community.

The New England Infant Cardiac program, through which infants with very serious congenital heart disease are rapidly transferred to this Center, gives the house officers an experience with the coming regionalization of medical care. Similarly, their service on the Tumor Therapy Ward shows them how a variety of experts in a large center can be brought together to focus effectively on the multifaceted care of a child with malignant disease. And we hope that, in the coming year, the Macy Program for training nurses to function as the professional associates of physicians in prenatal, postnatal, and pediatric care of mothers and children will give our house officers the highly relevant experience of learning how to extend their professional effectiveness by collaborating closely with nurse clinicians in the delivery of health care.

Because house officers, like medical students, differ markedly from one another in their background and in their career goals, we have tried to introduce increasing opportunities for choice and election of program into the training schedule. Opportunities for choice are necessarily limited in the first two years, but are very extensive in the third year of training, ranging from senior residencies on the in-patient services with four months of elective time, senior residencies on the ambulatory services with a considerable range of choice, to fellowships in a wide variety of clinical and investigative specialties like cardiology or hematology and in such broad fields as family health care. To meet the growing demand for training for family medical practice, Dr. Alpert has developed a residency program in Family Medicine with the Peter Bent Brigham Hospital which meets the requirements of the American Boards of Pediatrics and of Internal Medicine.

Dr. Adels continues to direct the program of Post-Graduate Education for practicing physicians. In addition to the weekly Grand Rounds and Clinico-Pathological Conferences held from 11:00 a.m. – 1:00 p.m. every Wednesday, a seminar on some topic of practical interest to pediatric and general physicians from this area has been conducted on one Wednesday afternoon a month by one or more members of the staff. The reception has been good, with attendance running from 16 to 36. The annual intensive Post-Graduate Course given by the Hospital staff in September, 1970, was very successful this year, with 195 physicians from 42 states attending. Likewise the course in Adolescent Medicine given in May, 1970 attracted an enthusiastic group of 100 physicians from 25 states and two foreign countries.

Means to Reach These Goals

A. "The ability to attract the best young people from all over the world into our training programs."

In this regard we have considerable cause for satisfaction. As in 1969, in 1970 we have had 139 applicants from 63 medical schools in the United States and Canada for our 12-15 internships, and nearly 100 of these were very satisfactory candidates. Because of this gratifying increase in the number of applicants, we reduced the number of persons taken into the first year program as junior residents and increased the number of persons accepted as interns. Last year, of 15 interns matched to our program, seven turned out to be women, and all, which should be no surprise, are doing a fine job.

The year 1968-69 was the last in which we operated two separate training programs, our regular program and a Coordinated Residency Program predominantly for foreign residents. Although this one year program, which combined service in several affiliated community hospitals with service in this institution, had been greatly improved by Dr. Adels, its participants felt like second-class citizens, even though they were often more experienced than our regular residents. Accordingly, the program was dropped this year. There is now a single large house staff, serving both the Children's Hospital Medical Center and the affiliated hospitals. The statistics in Table IV show that we neither discriminate against women nor against foreign citizens, each of whom comprise 28 percent of our present house officers. In fact, the presence of foreign physicians as regular members of our house staff greatly broadens the outlook as well as the impact of the institution.

Physicians may enter our training programs at any level--as interns just out of medical school, as junior residents following an internship elsewhere, or as senior residents following two years of pediatric training in another institution. Many who have completed their pediatric residency training elsewhere are attracted here for clinical and research training in a pediatric specialty.

The following general statements can be made about the advanced training opportunities which we offer:

a. **Training in clinical and research activities in a special field** is offered in Cardiology, Hematology; Immunology and Infectious Diseases with training grant support, providing for some of the staff and stipends for trainees, from the National Institutes of Health. In infectious diseases the training program is a joint one with the Department of Medicine at the Beth Israel Hospital, in immunology a joint one with the Department of Medicine at the Robert Breck Brigham Hospital. In hematology there is some collaboration with the Peter Bent Brigham Hospital but, in Cardiology, the training program is confined to the Children's Hospital Medical Center. Similar training is offered in Cystic Fibrosis and related diseases under a grant to Dr. Shwachman from the National Cystic Fibrosis Foundation while in Endocrinology, Renal-Metabolic Disease and Clinical Genetics, there are excellent opportunities for clinical and research training but no funds specifically earmarked for training stipends are available, although research funds can sometimes be found to support a research fellow.

b. **Advanced clinical training, with some research opportunities, is offered in the following fields:** Allergy with an available residency position, Family Health Care and Adolescent Medicine under grants from the Children's Bureau, the Family Health Foundation and the Grant Foundation, Tumor Therapy under the Children's Cancer Research Foundation, Psychiatry under a training grant from the National Institute of Mental Health, Neonatology at the Boston Hospital for Women and Social Pediatrics at the Beth Israel Hospital and Harvard School of Public Health. Over the years, the National Institutes of Health financed training programs particularly have attracted first-class people, and the threat that National Institutes of Health research training programs may no longer be funded would be a disaster for academic medicine, for the best young academic talent is recruited from them. The ruling of some years ago that foreign fellows could not be financed from National Institutes of Health training grants has created a lot of hardship since many of them are very able, are headed for teaching positions, and need just this type of training which they cannot obtain in their own countries.

The most encouraging aspect of our present academic program is the fact that we have been able to get a group of bright, young, well-trained individuals into the department in the last few years as instructors, assistant professors and research associates. They have given the Department an infusion of investigative and teaching talent which has noticeably lifted morale and begun to attract more of our house staff into academic training.

TABLE IV **MEDICAL HOUSE STAFF 1970-71**

	Total No.	Medical School			Citizen		Sex	
		U.S. & Canada	*Harvard*	*Foreign*	*U.S.*	*Foreign**	*Men*	*Women*
INTERNS	15	15	6	0	14	1	8	7
RESIDENTS								
Full Time	41	26	6	15	26	15	33	8
Part Time	2	2	0	0	2	0	1	1
TOTALS	58	43 (74%)	12 (21%)	15 (26%)	42 (72%)	16 (28%)	42 (72%)	16 (28%)

**Countries: Iran, Australia, India, Lebanon, Japan, Scotland, Great Britain, South Africa, Philippines, German, Taiwan.*

B. "Stabilization of the positions of the leaders in the various divisions of the full-time staff so as to give continuity to our major programs of research, teaching and patient care."

In this, the Trustees and Dr. Cronkhite have assured the future of the Children's Hospital Medical Center by their willingness to underwrite tenure for those who are at the peak of their academic careers. During the past few years this has been done for Dr. Gerald, Chief of the Division of Clinical Genetics, Dr. Rosen, Chief of the Division of Immunology and Dr. Nathan, Chief of the Division of Hematology; while the academic positions of three senior clinicians, Dr. Nadas, as Cardiologist, Dr. Berenberg, as Associate Physician-in-Chief and leader of our Cerebral Palsy program, and Dr. Shwachman, as Head of the Division of Clinical Nutrition, have also been stabilized by the Hospital, permitting them to devote their full energies to their hospital work.

C. "Finding the additional resources necessary to provide the facilities and financial security for those leaders upon whom the quality of work will always depend."

Here, there is more to do than has been accomplished. Although the Hospital has guaranteed to stand behind the academic salaries of a group of six leaders in the Medical Department, every effort must be made to add new grants or endowments to protect the Hospital's resources. In one instance, a five-year professorial grant from the United Cerebral Palsy Association has been obtained. Additional endowment for the work of another division has been obtained with help from the Medical School. Nevertheless, two of the men cited above are nearing the termination of Research Career Development Awards from the National Institutes of Health, which have paid their full salaries for four and eight years respectively, and, unless other funds are forthcoming, the Hospital will be forced to provide these salaries.

Another potential source of funds to support staff salaries are third-party payments for the care of patients. Until recently, the enormous total effort of the staff in the care of the patients of of the Hospital, as distinct from private patients, was totally unrecompensed. Within the past two years, collections for professional services from Blue Shield and Medicaid seemed to be a hopeful way of supporting the activities of the Staff, and until this July collections came in very well. However, since then, with the utter confusion in Medicaid and as the result of an investigation by Blue Shield, there has been such delay in payment of fees for professional services to the General Medical Services Fund, established with approval of the Trustees, that it is hard to tell what is going to happen to this reasonable and legitimate mechanism for paying or supplementing staff salaries. So despite the unfavorable economic situation, a strong effort will have to be made by the Department, with the help of the Hospital, to increase our income from grants and endowment for support of the staff.

A Look Ahead

At the present time, we seem to be on the threshold of a new era. The past two decades have been ones of unprecedented expansion in the activities of the Hospital, and there has been tremendous parallel growth of staff and facilities to carry on these activities. This growth has been the result of several forces:

1. The farsighted plans and drive towards an exciting goal, initiated in Mr. Farley's Presidency and inspired by Dr. Farber's vision and devotion to the ideal of a medical center for children. The close collaboration of these two men transformed this institution from a children's hospital to a children's medical center and left an indelible mark on American pediatrics. Dr. Farber's philosophy and ideas are embodies in the design of our new Pediatric Sciences Building and in the fabric of public and private support as well as in the plans for many of our new activities. But his conceptions are most clearly exemplified in the arrangements for total care of children with cancer by a team of skilled, dedicated men and women from various disciplines, whose efforts have been harmoniously blended, like an orchestra, under his baton. Since Dr. Farber's retirement from the Hospital in September, 1970, the Tumor Therapy Group has continued, with its medical members constituting the Division of Oncology in the Department under the leadership of Dr. Berenberg as Acting Chief, until such time as a full-time Chief can be found to link together the efforts of the Hospital and the Children's Cancer Research Foundation on behalf of children with neoplastic disease.

2. The affluence of post-war America, as reflected in the generosity of private donors and the public confidence that spending large sums of money by the government on medical research would greatly accelerate the conquest of the dread diseases. Here again, Dr. Farber played a major role as a spokesman for the National Institutes of Health before Congressional Appropriations Committees. His influence and creative thinking had much to do with the expanding appropriations for research and research training grants, for grants for the construction of research facilities, for the initiation of the imaginative Research Career and Career Development Award Programs, for the concept of General Research Support Grants, and for the Clinical Research Center program. In this Hospital, and particularly in our Department and its various divisions, we have benefitted enormously from each one of these National Institutes of Health programs.

3. The bold and dynamic leadership provided in recent years by Dr. Cronkhite as General Director, backed by the support of Mr. Wolbach as President, and the superb job by the Trustees under the leadership of Mr. Helmuth in raising funds during the REACH campaign.

It has been an exciting period to live through. The pattern has now been set, the new facilities so desperately needed at the Hospital and dreamed of for 25 years are now a reality. A new group of young, vigorous and promising Chiefs are coming on to the Hospital staff and a new era is beginning. These next few years will probably be a period of consolidation, of interinstitutional cooperation, of greater regional and community planning, as we attempt to make limited resources and even more limited manpower stretch as far as possible in meeting the tremendous health problems that face us in our cities and in the whole developing world. There will be greater emphasis on the delivery of health care, greater use of monitoring, automation and other labor and time saving devices, greater use of nurse clinicians, physicians' assistants and health aides. This Hospital must play its part in these developments, but it must continue to maintain its program of research and training at the most fundamental level possible, because, with its staff, its reputation among patients who come here for the treatment of serious disease, its magnificent facilities for combined clinical and basic research, and its strategic location in the Harvard Medical Area, it is in a unique position to obtain the knowledge needed to overcome the still unconquered diseases of children. The biological revolution occurring in the country's laboratories and hospitals is as momentous and as full of promise as the social revolution clearly taking place among students and intellectuals and, like it, must be directed towards improvement in the quality of life for children.

In preparing this report it has only been possible to present a few highlights of the past two years. The solid accomplishments of the Department are found in the publications by its members, in the house officers and fellows whose devotion and hard work during their term of training here is largely responsible for the best manifestation of its work--the gratitude of parents for a child recovered from a serious illness or, if the outcome was less happy, for the sympathy and kindness which they encountered here. Ultimately, the surest sign that, as pediatricians, we are achieving our basic purpose will be a steady decline in visits to the Emergency and Consultation Clinics and particularly in medical admissions to this and all other pediatric hospital services.

Department of Neurology

Charles F. Barlow, M.D.

The two year period since the Centennial publication has seen a number of changes in the department, and changes will be emphasized in this narrative. Fortunately, however, some things do not change. In this respect, I am pleased to report that we can continue to turn to Dr. Randolph Byers for an active, full time contribution to our department. In 1971, Dr. Byers will celebrate his seventy-fifth birthday, fiftieth anniversary of graduation from Harvard Medical School, and fiftieth anniversary of his marriage. In recognition of his many years of service to Children's Hospital Medical Center, a conference room in the Pediatric Sciences Research Building will be known as the Randolph Byers Room. This room will be dedicated on May 26, 1971, when his friends and colleagues have planned a day of activities to recognize his many contributions to the field of the neurology of childhood, and to Children's Hospital Medical Center. We all look forward to many more years of his active participation at Children's.

Patient Care

The central activity of the department continues to be the care of patients. The inpatient service is busy, although emphasis has shifted to the care of more acute neurologic disease and short term admissions for diagnostic workup involving procedures which cannot be done on an ambulatory basis. Statistics of the division show a progressive abbreviation of hospital stay, a tribute to more efficient management as well as some shift in the variety of patient admitted. The economics of today do not permit the leisurely multidisciplinary assessment of complex problems of mentation, behavior, learning disabilities, and communication disorders in an inpatient setting, as was possible ten or more years ago. Fortunately, unusually fine facilities for ambulatory care have been developed at Children's Hospital Medical Center, and we are learning how to use them more effectively as each year goes by. The facilities of the inpatient neurology division, which were unique in the world fifty years ago in accordance with the concept and problems of child neurology of that era, do not serve as well today, despite the fact that they have been extensively remodelled in recent years. The remodelling has made a more efficient nursing unit and provided all the emergency care facilities necessary for our acutely ill patients. The insoluble problem in our current space is patient density in the large room which contains two-thirds of the available beds. Combined patient, parent, and staff density in this room is easily the highest in the hospital. The room also serves as the only supervised play and eating area for patients not confined to bed.

Training

It has been said that a measure of success in teaching is the realization that the physicians we have trained have more to contribute to the field than their teachers. In surveying some of the products of our program, however damaging it may be to one's ego, I am pleased to indicate that it is true. The Crothers Professor is responsible to the Dean of Harvard Medical School for providing a one month clerkship in Neurology. These young men from the third and fourth year are provided an experience with children at Children's Hospital Medical Center, and the adult experience is obtained at either Peter Bent Brigham or Beth Israel Hospitals. For postgraduate neurological experience in the specialty of Neurology, the resources of the three hospitals are also utilized. Our formal association with the Brigham for neurological training now dates back seven years. The more recently developed neurological service at the Beth Israel is now fully integrated into the Training Program. In addition to clinical experience with both adults and children, our trainees are exposed to neuropathology (Dr. Floyd Gilles and E. Tessa Hedley-Whyte), and electroencephalography (Dr. Cesare Lombroso and staff), as well as a number of elective and research opportunities. A significant number of the graduates of the overall program look forward to careers in Child Neurology, and many of the trainees of the past seven years now hold academic posts here and elsewhere.

Staff Changes

One of the pleasures of working in an academic center is the fact that one can observe careers of our younger staff develop and mature. This process leads to national and international visibility, and the departure of friends and colleagues to other centers. Dr. Robert W.P. Cutler came to us from his residency at the University of Chicago. After a four year period, first as a research fellow and then on the faculty and staff, he returned to the University of Chicago as Associate Professor, in July, 1968. His contributions to our clinical program, and particularly outstanding research on the subject of solute transport in cerebrospinal fluid, was a significant loss. Dr. Gordon Watters played an important role in our teaching and clinical program between 1965 and 1969, when he departed to accept an Associate Professorship at McGill University in Canada, and became Chief of the Child Neurology Section at Montreal Children's Hospital. Dr. Helen Cserr spent an all too brief, 18 months in our laboratory as Instructor in Physiology. Her research and teaching interest in the blood-brain barrier and the embryology of cerebral fluids made her a valued contributor to our overall research program. In July, 1970, she accepted a position as Assistant Professor of Physiology at Brown University.

At the same time, we have been fortunate, indeed, to welcome a number of new young people to the staff. Space does not permit an appropriate review of their background other than to indicate that most of the young neurologists were products of our own program. This group consists of the following: Dr. Generoso Gascon (Assistant Professor, interested in seizure problems and language and learning disabilities); Dr. Michael Bresnan (Instructor, clinical research and teaching); Dr. Israel Abroms (Instructor, neurology of the newborn and cerebral palsy); Dr. Liza Yessayan (Instructor, clinical research and Maternal and Infant Health study); Dr. Frank Duffy (Instructor, experimental neurophysiology); Dr. Hubert Mickel (Instructor, experimental neuropathology and lipid neurochemistry); Dr. S. Robert Snodgrass (Instructor, cerebral solute physiology and active transport). In addition, the Department, in conjunction with the Mental Retardation program, has recruited three young Ph.D. scientists, Dr. Norman Uretsky (Pharmacology of central nervous system chemical transmitters); Dr. James Burchfiel (Pharmacology and neurophysiology); and Dr. Yoichi Matsumiya (Director of Special Procedures in the Division of Clinical Neurophysiology).

Research

The research activities of the department are in large part incorporated within the larger Mental Retardation and Human Development Research Program of the hospital. A special emphasis has been placed on close collaboration between departments and disciplines. For example, investigators from Neurology, Neurosurgery, and Pharmacology have concentrated on the problem of human hydrocephalus. Accurate measurements of the normal rate of formation and the absorption of cerebrospinal fluid have been made for the first time in children, and more recently several patterns of abnormality of absorpiton defect in hydrocephalus have been defined. At the same time, the investigators in the neurology laboratories under the direction of Dr. Antonio Lorenzo (Assistant Professor of Pharmacology and Neurology) are studying more fundamental problems of the movement of materials into and out of brain and other related problems, such as spontaneous hydrocephalus in dogs, and the effect of experimental seizures on the blood-brain barrier.

Study of the electrical events of the human brain continues to be the major emphasis of Dr. Lombroso's laboratory in the Division of Clinical Neurophysiology. The observations on computer averaged evoked potentials have now been extended to the newborn infant and are being correlated with immediate behavioral observations and long term outlook by Dr. Abroms in collaboration with Dr. Peter Wolff, of the Department of Psychiatry. A basic electroneurophysiology laboratory is now established wherein problems suggested in the patient can be investigated in animals. This laboratory regularly samples the electrical activity of single nerve cells by means of microelectrodes.

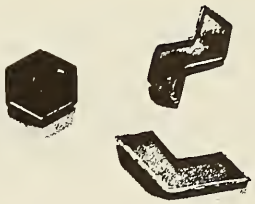
The biochemical reactions of brain tissue are of fundamental importance to the understanding of brain disease. With the facilities of the new research building and the mental retardation program, it has been recently possible to develop a new research effort in this area. Dr. David Dawson, Assistant Professor of Neurology, who divides his clinical activities between Children's Hospital Medical Center and the Peter Bent Brigham Hospital, has brought his enzymology laboratory here. Dr. Norman Uretsky will concentrate on those biochemical substances that transmit messages from one nerve cell to another, and collaborate with Dr. R. Schoenfeld, another young pharmacologist from the Department of Psychiatry, who will study concomitant behavior and performance. Dr. Mickel is prepared to study lipid biochemistry, and his arrival adds a biochemical dimension to the interest in disorders of myelin (the "insulating" substance surrounding the long interconnections between nerve cells) well established by Dr. Gilles and Dr. Hedley-Whyte in Neuropathology.

Plans for the Future

The greatest challenge of the next two year period will be to consolidate and develop our research programs in the elegant new facilities that have been provided. In the relatively recent past, the primary problem was to find and encourage imaginative people. The wherewithal to fund their activities was virtually assured if the choice of people was good. This state of affairs no longer exists due to major reductions of national governmental support for research. Yet it is absolutely clear that we cannot rest with the discharge of our obligations to the community for the diagnosis and management of neurological problems and the training of other physicians to do the same. Unless we learn more about disease of the nervous system, we shall not be able to prevent more of the brain damaging events which lead to what I consider to be the major catastrophe of childhood -- profound mental retardation. For a single failure of prevention, the cost to family and community for a year ranges from $3,000 to $5,000 for the individual's lifetime, to say nothing of the fundamental issue of family and individual human tragedy. Any single statistic must be multiplied by approximately one million, because this is a common problem. Although mental deficiency is a representative neurological problem in childhood, there are a host of other disorders which reflect unsolved problems, such as seizure disorders and cerebral palsy.

STATISTICS

Outpatient Visits	*1969-1970*
Total Neurology (Including Seizure)	4,936
New	2,414
Inpatients	
Total admissions	4,335
Total patient days	3,008
% Occupancy	91.4
Division of Clinical Neurophysiology	
Total electroencephalograms	4,257
Sonar scan	537
Special procedures	333



Department of Neurosurgery

John Shillito, Jr., M.D.

Since our previous detailed annual report in 1968, this department has suffered the loss of Dr. Donald Matson, who died May 10, 1969, after the inexorable march of a mysterious illness which crippled his nervous system within 18 months of the first symptom. He remained actively concerned with this department from his hospital bed until the last few months of his illness.

Drs. Shillito and Page initially continued alone, with the welcome part-time assistance of Dr. Francis Rockett in our outpatient clinic. Thanks to the extra efforts of our resident, nursing and secretarial staff, patient care, the training program and our responsibilities at the Medical School and other hospitals continued to be fulfilled.

In July, 1969, we were fortunate in gaining as our associate Dr. William Heisey, who trained at the Cleveland Clinic. A competent neurosurgeon with a variety of experience, Dr. Heisey is also thoughtful and sensitive in his relationship with patients and their families. Qualities such as these must be kept uppermost in every clinical department.

In September, 1969, Dr. Edward Katz rejoined us for one year, having served two years in the Army upon completionof his residency training here.

With our clinical attending staff thus back to full complement, some of the teaching and administrative duties of the department could be better accomplished and more widely shared.

The neurosurgical laboratory was without a Director after Dr. Galicich left in 1967, and in July, 1970, Dr. Hubert S. Mickel was appointed Acting Director of the laboratory and Research Associate in Neurosurgery, while holding appointments also in Neurology and Neuropathology. Dr. Mickel has been trained in neurology, but his interests lie in biochemistry. He is currently engaged in the identification of certain fatty substances in the spinal fluid in degenerative diseases of the nervous system. These substances also are found in certain brain tumors and their presence in spinal fluid may be an early clue to the presence of such lesions.

Patient Activities

Our weekly outpatient clinic has between 900 and 1,000 visits per year. Of these, between one third and one half are new patients. Former patients are seen at intervals throughout their growth period, as so many of our neurosurgical problems demand continued vigilance to ensure, for example, proper function of shunts for hydrocephalus, or continued patency of intentionally-created skull defects to allow normal growth of the brain. Patients who have had tumors of the brain or spinal canal are observed into adulthood, and their care can be continued at the Peter Bent Brigham Hospital, where we meet them in our weekly clinic across the street.

We continue to perform approximately 350 operations per year. In 1970, 36 were for brain tumors and 12 for tumors within the spinal canal. There were 140 shunting procedures to relieve hydrocephalus, including the elective lengthening of the necessary plastic tubes as a child grows. Once shunted, a child rarely overcomes the need for this apparatus. There were 63 operations for congenital abnormalities of the skull or the spine; either releasing abnormal fusion of the bones of the skull to make room for the brain to grow properly, or covering exposed nervous tissue in the low back, the myelomeningocele. There is on the average one operation per week to repair damage caused by automobile or bicycle accidents, falls, or laceration of nerves. Several children are seen daily with lesser injuries not requiring surgery, and many are admitted for observation, either from our own emergency ward or on referral from suburban hospitals where neurosurgical coverage is less close. A variety of other conditions round out the list; brain abscess, spontaneous bleeding in the brain from blood vessel abnormalities, complications of meningitis, ruptured discs, procedures to relieve pain in terminal cancer and removal of damaged portions of the brain to improve control of convulsive seizures.

In addition to our clinic and the emergency ward, our attending staff sees close to 1,000 private patients per year in our office suite in the hospital, with admissions as necessary. Our ward, Division 33, carries 21 patients most of the time, occasionally overflowing its capacity of 27 to other floors. With active pediatric and neurology services, more and more patients come to surgery after initial studies on these services, with our collaboration.

Technical Research

Our resident staff was led by Dr. Howard Eisenberg for the first six months of 1970, who then left for the Navy with plans to return in two years to continue work in research and to assist with patient care. Dr. Edwin G. Fisher became Chief Resident in July, and we hope will remain nearby upon completion of his training in July of 1971. Dr. Robin Davidson began the year in neurology, and is now Senior Assistant Resident on our service. Dr. Gordon McComb spent six months in neuropathology after finishing his first clinical year on Division 33. Two men joined us in July, Dr. James McLennan, who started in neurology, and Dr. John Walsh, on Division 33.

Two men spent six months with us as part of their neurosurgical training, Dr. Stephan Martin from Minneapolis, and Dr. Noe Vargas of Mexico City. Dr. Gerald Moore came from Detroit for three months. Pediatric neurosurgery is becoming a more important aspect of residency training, and the need for expertise in its special problems is being reflected not only by frequent visitors but also by the establishment of pediatric neurosurgical sections in some of our national societies. Children's Hospital has long held a well-deserved reputation in the field, and we will strive to continue these traditions.

In the past two years we have purchased two operating microscopes, with the help of special gifts and the donations of many parents and relatives. These floor-mounted binocular systems can be used in the operating room to aid in the removal of tumors growing in such important areas as the spinal cord, in repairing minute blood vessels of the brain, or splicing together nerves within the skull. Long used by our ophthalmological and otolaryngological colleagues, such equipment is finding greater use in our specialty as well. Considerable training is necessary to achieve facility in microsurgery, and one of the microscopes has a second binocular head, to enable us to teach and observe our residents in the laboratory.

Dr. Page has been collaborating with Dr. Lorenzo of the Neurology Department in studies of the rate of production and absorption of spinal fluid in hydrocephalus.

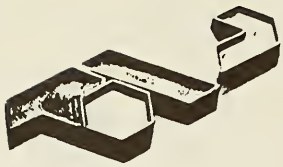
Dr. Shillito was appointed to the Board of Governors of the American College of Surgeons representing the Congress of Neurological Surgeons, and to the Board of Directors of the American Association of Neurological Surgeons. Dr. Page is becoming involved in the Scientific Program Committees of the Congress of Neurological Surgeons. Dr. Heisey, in addition to serving at Beverly Hospital with Dr. Page, has been appointed consultant at the Naval Hospital in Chelsea and visiting neurosurgeon at the Hunt Memorial Hospital in Danvers.

In response to a request from the Veterans Administration in the spring of 1970, the Neurosurgical Service at the Boston Veterans Administration Hospital on South Huntington Avenue became the responsibility of Dr. Shillito and his attending staff for one year; Drs. Heisey, Page and Katz have made our participation in this temporary additional community service possible.

The Future

During early 1970, Dean Ebert of Harvard Medical School convened a committee to appoint a successor to the late Dr. Matson as the Franc D. Ingraham Professor of Neurosurgery. By spring Dr. Keasley Welch of Denver, Colorado, was selected and arrived in January, 1971.

Trained in New Haven and Montreal, Dr. Welch has a varied experience in clinical neurosurgery, and for the past decade has been interested in studying the mechanism of formation and absorption of spinal fluid. He will direct our research laboratory and, with the help of those already on the scene, head the Department of Neurosurgery. With the demands of patient care, teaching, research and administration now so increased in scope and complexity, we hope that with some division of the labor we can still better retain the integrity and reputation of this department, go forward in research related to our clinical problems, and continue to deliver excellent medical care by the best available techniques.



Department of Ophthalmology

Richard M. Robb, M.D.

Largely because of external circumstances, the past two years have been ones of limited expansion and financial stringency at The Children's Hospital Medical Center. Within the Department of Ophthalmology these factors have been felt, but on the whole our level of activity has increased, and the prospects for significant new developments in the near future are good.

Departmental Growth

In the area of patient care our volume of outpatient visits and in-patient admissions has gradually increased. In 1970 there were 3,919 visits to our outpatient department and 190 hospital admissions for eye surgery. The Eye Department was assigned for the first time a group of in-patient beds on Division 14 reserved on a first-priority basis for eye patients. More important than numbers of patients or beds has been the gradual increase in referrals for consultation or for care of the more difficult ocular problems of childhood. This development, although harder to quantitate, is certainly of major importance to us in a university-affiliated teaching hospital.

Our opportunities for teaching have increased with the addition of a second resident rotating from the Massachusetts Eye and Ear Infirmary. The wide variety of unusual pediatric ocular disease seen by these residents continues to broaden their training significantly. We have also obtained certification for a preceptorship in orthoptics from the American Orthoptic Council. Our new orthoptist, Miss Nancy Capobianco, can look forward to her first preceptee beginning in July, 1971. Miss Capobianco joined us in July, 1970, after 16 years of distinguished orthoptic work in the Eye Clinic of the University of Rome, Italy.

A significant new service was added to our outpatient unit in 1970 when Mrs. James Perry became our first full-time optician. This optical service offers factors of convenience and economy not previously available to our patients, and we can now reliably provide glasses which are small enough to fit young faces and strong enough to withstand the bounces and scratches which are in inescapable part of childhood.

On the in-patient side, an important addition to our operating room facilities was the acquisition of an operating microscope with photographic attachments, made possible by a gift from the Iota Phi Sorority. In both glaucoma and cataract surgery, microsurgical techniques have become more and more useful, especially in children. We plan to explore these techniques and apply them where they seem appropriate to our surgical problems.

Medical Staff

Dr. Robert Petersen returned to Children's in August, 1969, after two years of service with the army, one of those years in Vietnam. For many reasons we are happy to have Dr. Petersen back. He has added breadth to our professional staff. He has assumed responsibility for all our outpatient services, including our highly valuable diagnostic index system. His recent clinical interest in the retinopathy of cyanotic congenital heart disease, an interest pursued with Dr. Amnon Rosenthal of the Department of Cardiology, has shed new light on this ocular manifestation of an important pediatric illness.

Dr. David Walton has continued his interest in congenital and childhood glaucoma, and is now spending part of his time in laboratory pursuits in association with Dr. W. Morton Grant at Harvard's Howe Laboratory of Ophthalmology. Dr. Walton's extensive understanding of pediatric systemic disease has also made him an invaluable asset in providing hospital consultations, and as a natural extension of this he has assumed responsibility for all in-patient departmental activities.

Dr. Eliot Berson left Children's in January, 1970, to pursue his interest in electroretinography at the Massachusetts Eye and Ear Infirmary. His valuable services are still available to us in this new setting, and beyond this we are fortunate to have two members of Dr. Lombroso's neurophysiology group, Dr. Frank Duffy and Dr. Yoichi Matsumiya, who are particularly interested in and experienced with visual electrophysiology. We look forward to enlarging our collaborative efforts with these men.

Research Laboratories

One of our most important challenges in the coming years will be the staffing of an eye unit in the hospital's new Laboratories for Pediatric Research. Our plan is initially to establish a laboratory for the study of developmental abnormalities of the eye, with special emphasis on immunochemical techniques of investigation. At the same time we plan to set up a laboratory for the study of post-mortem eye specimens made available to us by our Department of Pathology. We feel these two units will be complimentary and that both of them will contribute to and gain from the activities of other laboratories in the hospital. We are understandably excited about the prospect of launching this laboratory research unit and are hopeful of obtaining for it that measure of financial stability that will enhance its growth and long-term productivity.

Department of Orthopedics

Arthur M. Pappas, M.D.

The period covered in this report was one of change for the Orthopedic Department - - change in personnel, in location, and in teaching, clinical, and research programs. Despite the upheaval attending rapid change, it has been a period of growth in the number of patients cared for and in the number of residents trained, a period which has witnessed new directions in specialty clinics and orthopedic research units. Undoubtedly the maintenance of stability during change is a testament to the personnel involved.

During this period several outstanding orthopedists left the department. In 1968, Dr. William T. Green became the Emeritus Harriet M. Peabody Professor of Orthodpedic Surgery and Emeritus Orthopedic Surgeon-in-Chief, and Dr. Arthur M. Pappas was named Acting Orthopedic Surgeon-in-Chief. Since retirement, Dr. Green has redirected his interests from daily care of patients to a review of his many clinical accomplishments in the field of pediatric orthopedic surgery. In March of 1969, Dr. Paul P. Griffin assumed the position of Orthopedic Surgeon-in-Chief at the Children's Hospital in Washington, D.C. In 1970, it was announced that Dr. Henry H. Banks had been appointed the Professor and Chairman of the Department of Orthopedic Surgery at Tufts University Medical School. Joining Dr. Banks in his move was Dr. Seymour Zimbler, who had been an active contributor to the clinic organization and the resident teaching program.

To assume the responsibilities formerly fulfilled by these men, several new additions were made to our geographical full-time staff. Dr. Arthur L. Boland and Dr. Robert B. Keller, who had completed their training in our Combined Orthopedic Residency Training Program, joined the staff and each assumed the responsibility for development of two specialty clinics - - Dr. Boland for the Arthritis Clinic and the newly formed Athletic Injury Clinic, and Dr. Keller for the Scoliosis Clinic and the Fracture Clinic. Dr. Benjamin E. Bierbaum was appointed to the staff with responsibility for coordinating the Outpatient Clinics. Dr. Sandra Thomson, following visits to many of the centers for pediatric rehabilitation and amputee training on this continent and Europe, was appointed to expand our interest in the field of rehabilitation and prosthetics. Dr. Clement B. Sledge and Dr. J. Drennan Lowell, who had considerable interest in the field of pediatric orthopedic surgery while ont he staff of the Massachusetts General Hospital, were appointed as members of the attending staff at The Children's Hospital Medical Center and, concurrently, as geographic staff at other Harvard Medical School hospitals: Dr. Sledge having been appointed the Chairman of the Orthopedic Department for the Robert Breck Brigham Hospital and the Peter Bent Brigham Hospital; and Dr. Lowell, the Clinical Director of Orthopedic Surgery at the Peter Bent Brigham Hospital.

In September 1970, the Harvard Medical School announced that Dr. Melvin J. Glimcher had been appointed the Harriet M. Peabody Professor of Orthopedic Surgery at the Harvard Medical School and Orthopedic Surgeon-in-Chief at The Children's Hospital Medical Center. Reflecting the nation-wide trend toward new patterns of organization to meet the demands of patterns of responsibility, a second appointment is currently under consideration: the Professor of Clinical Orthopedic Surgery at Harvard Medical School and Chief of Clinical Orthopedics at The Children's Hospital Medical Center.

To meet the need for more space as the Orthopedic as the Orthopedic Department, Radiology Department, Nuclear Medicine Department, and Clinical Laboratories developed, there was a major redistribution of space allocations within the hospital. During the summer of 1969, our offices, administrative area, library, and private patient visit area relocated to the second floor of the 300 Longwood Avenue Building.

Patient Care

With the opening of the Fegan Building, outpatient facilities were centralized there, facilitating the development of coordinated multiple disciplined clinics. Formerly, the child requiring multiple specialty visits was requested to visit several independent clinics which were frequently some distance apart with different time schedules on different days, as well as with independent records. The new physical and administrative organization of the clinics now housed in the Fegan Outpatient Building make possible a new coordinated effort to treat children with problems in multiple disciplines.

The interdependence of clinical services is exemplified in the Myelodysplasia Clinic where children are seen by orthopedist (Dr. A. Trott), neurosurgeon, urologist, and social work during one visit; the Cerebral Palsy Clinic where we have an orthopedist (Dr. P. Panagakos), neurologist, pediatrician, physical therapist, and social worker; the Arthritis Clinic where we have an orthopedist (Dr. A. Boland), pediatric rheumatologist, and physical therapist; the Prosthetic Clinic where there is an orthopedist (Dr. S. Thomson), psychiatrist, physical therapist, prosthetist, and social worker; and the Scoliosis Clinic where there is an orthopedist (Dr. R. Keller), orthotist, and physical therapist.

The changing pattern of care for the physically handicapped child is reflected also in a trend towards the regionalization of care for major medical illnesses. The developing multidisciplined clinics in the Orthopedic Outpatient Department of the Children's Hospital have complemented the regional clinics held under the auspices of the Bureau for Handicapped Children, Department of Public Health, Commonwealth of Massachusetts. A predominance of problems seen in the children who attend most of these regional clinics are orthopedic. As the primary consultant in these clinics is an orthopedist, major modifications in individual patient programs cannot be implemented without additional consultations. Thus the child is seen regularly in the regional clinics and, as the need for review of his program becomes evident, he is referred to one of the multiple discipline clinics at the Children's Hospital. This inter-relationship between in-hospital and regional clinics provides more continuous care with specialized consultants, when needed, without prolonged waiting, multiple visits to the Outpatient Clinic, or hospital admission. We anticipate increased coordination between Commonwealth multi-discipline clinics and Children's Hospital Medical Center clinics as well as clinics of other teaching hospitals.

As patterns of care for the physically handicapped child continue to develop, the inpatient and outpatient population of the Orthopedic Department grows. The occupancy rate for 1969 was 95 percent. During this year there were 2005 orthopedic admissions to the hospital with 1368 operative procedures being performed. There were 13,975 visits to the Outpatient clinics. The occupancy rate for 1970 was 97 percent and there were 2058 admissions to the hospital with 1401 operative procedures performed. There were 15,560 Outpatient clinic visits. In addition to the 95 and 97 percent occupancy rate calculated from patients on the Divisions designated for orthopedics (Divisions 26, 36, and 71), many patients were boarded on other divisions, demonstrating the need for additional bed assignments for a growing, extremely active service.

Teaching

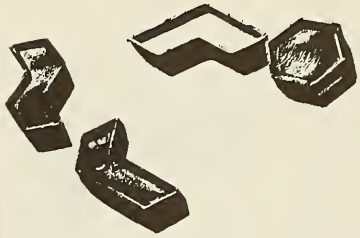
During the period of this report, the resident training program has also continued to increase in size. In 1968 we enlarged our enrollment from two to three residents every three months for a total of 12 residents per year entering the Combined Orthopedic Training Program. The additional four residents made necessary a reorganization of the Resident Training Program, including a redistribution of time in the combined hospitals. All residents now start at The Children's Hospital Medical Center and spend their first nine months on various inpatient wards, general orthopedic outpatient clinics, specialty orthopedic clinics, and the Division 71 rehabilitation area. Residents then rotate to the Massachusetts General Hospital for 15 months of introduction to adult orthopedic problems. At the beginning of their third year in the program, they return to Children's for six months of advanced training and responsibility in the care of pediatric orthopedic patients. The last 12 months of their three and a half year program includes three months in general adult orthopedics, three months in adult reconstructive orthopedics, and six months as Chief Resident at one of the Harvard-affiliated hospitals.

Research

During the period of the report, the research activity of the Orthopedic Department continued under the general direction of Dr. Jonathan Cohen and Dr. Arthur Pappas until September, 1970, with the appointment of Dr. Melvin J. Glimcher. Dr. Cohen maintained a major investigational interest in the evaluation of biomedical materials, particularly the metallic constituents of implant material that is utilized in orthopedic surgery. Dr. Pappas' laboratory interest has been directed towards the biological response of skeletal tissues, in particular the acceptance of bone grafts stored under different conditions of freezing and freeze-drying, and the acceptance of grafts by a host animal that had been sensitized with previous fresh grafts or where the initial terminal response had been suppressed. The laboratory and clinical investigation of congenital malformations continues to be the major area of investigative interest for Dr. Pappas. Experimental animal models have been devised that permit the induction and development of selected congenital malformations for the evaluation of both the micro- and macroscopic assessment. To complement his basic science interest in congenital malformations of musculoskeletal systems, Dr. Pappas, in collaboration with Miss Margaret Anderson, is reviewing the children enrolled in the Growth Study who have had congenital malformations of their lower extremities -- viz., hemihypertrophy and hemiatrophy, congenital abnormalities of the femur, absence of the fibula, and bowing of the tibia. A most recent project, presented at the Clinical Congress of Surgeons in 1970 by Dr. Harry Love, was the biological perfusion of an isolated extremity. This represents a mjaor collaborative investigative effort between the Department of Orthopedic Surgery and the Department of General Surgery under the guidance of Dr. M. Judah Folkman.

These projects will be continuing in the new and expanded orthopedic research program that will be under the overall direction of Dr. Melvin J. Glimcher. Dr. Glimcher, generally acknowledged as one of the leading basic investigators in the musculoskeletal field, will bring his own orthopedic research to the Pediatric Sciences Building. We look forward to his continued contribution in the field of basic collagen and crystalization research, further evaluation of the biomechanical role of coordinated musculoskeletal function, and his newest endeavor, in collaboration with Dr. Eric Radin, in the role of joint function, lubrication, and cartilage metabolism.

The Children's Hospital Medical Center has long been considered the fountainhead for pediatric orthopedic surgery in this country. The future must maintain and expand our prominence in providing care for handicapped children while continuing basic research in orthopedics. As our period of major changes in personnel, program, and organization tapers off, we look forward to greater collaborative efforts, which will retain our strong clinical heritage and extend the horizons of patient care, teaching, and research -- advances that will require the sharing of knowledge arising in our basic science laboratories with clinical staff for its meaningful and humanitarian application. In the years that lie ahead, we anticipate a significant integration of scientific training of clinical physicians to provide the best possible care for children.



Department of Otolaryngology

Burton F. Jaffe, M.D.

On September 31, 1970, Dr. Carlyle G. Flake retired as Chief of the Department of Otolaryngology after ably serving since 1947. Dr. Flake received his training at John Hopkins Medical School, coming to CHMC in 1935. He has made significant contributions in Otolaryngology, and was active in demonstrating vascular and other anomalies of the upper food and air passages by using contrast material in conjunction with x-ray studies. His interest in the subglottic laryngeal hemangioma resulted in early detection and better treatment with a resultant drop in mortality rate from 50 per cent to six per cent. His innovative repair for congenital choanal atresia via a transpalatal approach is used by many surgeons currently. He also pioneered in developing the supersaturated cold humidity rooms in the treatment of respiratory tract infections.

On October 1, 1971, Dr. Burton F. Jaffe became the second Chief of the Department of Otolaryngology at Children's Hospital. He received his medical education at Tufts Medical School, trained in general surgery and Otolaryngology, and received his Boards in both specialties. Following his residency he served on the Navajo Reservation and was at the Public Health Service Hospital in Gallup, N.M., as Chief of the Department of Otolaryngology and Chief of the Cleft Palate Clinic. After that he returned to the Staff of the Department of Otolaryngology of the University of Michigan where he had taken his residency and remained there until his move to Boston. On June 15, 1970, Dr. Jaffe was appointed Chief of the Department of Otolaryngology at Beth Israel Hospital, and at the present time serves both institutions.

Department Staff

Dr. Charles F. Ferguson, geographically located in Children's Hospital, in an outstanding authority in laryngology, bronchology and esophagology, and has served as President of an American Broncho-Esophagological Society. He has published many articles and at the current time is writing and editing a book on Pediatric Otolaryngology. His expertise is especially valuable for resident training in Otolaryngology. There are five non-hospital based Otolaryngologists associated with Children's Hospital and who share in the teaching responsibilities. Dr. Charles Ferguson and Dr. John Trakas are Senior Associates in Otolaryngology and Drs. Sidney Shore, Robert Clubb, A. Greer Edwards, Jr., and Clarence Kylander are Associates in Otolaryngology. Dr. Harold Schuknecht and Dr. William Montgomery are Consultants from the Massachusetts Eye and Ear Infirmary.

A resident in Otolaryngology from Massachusetts Eye and Ear Infirmary rotates through the Department of Otolaryngology as part of his intermediate year of training. He is responsible for the care and management of a large number of children whom he sees in the Out-Patient Department and as in-patients requiring surgery. Consultants are available in the OPD, and on each operating day a consultant is in attendance. At the present time he sees a great number of children with hearing losses, chronic draining ears, recurrent tonsillities, laryngeal stridor, foreign bodies of the upper respiratory tract, facial paralysis, and head and neck masses.

Out-Patient Department

There has been a revision in the Out-Patient Department in order to emphasize certain areas in our specialty. There are still three one-half day general E.N.T. Clinics. In addition, there are now three special Otolaryngology Clinics established: One, a Chronic Draining Ear Clinic, which it is anticipated that students, interns and residents in any specialty will attend to learn more about this very difficult and relatively common problem; two, a Malformed Ear Clinic, to evaluate infants and children with not only malformations of the outer ear, but associated malformations of the middle or inner ear resulting in hearing loss or deafness; three, an E.N.T.-Speech Clinic has been established to bring the disciplines of speech therapy and Otolaryngology together to deal with the child with a speech defect. It is important not only to observe the larynx, but to understand the speech patterns in order to make better diagnoses and better judgements for therapy.

Otolaryngology remains in the A Building on Division 14. Besides the 15 general beds there are three supersaturated cold-humidity rooms for the treatment of upper airway obstruction due to infection. There is a dedicated, well-trained nursing staff who deals specifically with these E.N.T. problems.

The "Throat OR" has been renamed the "E.N.T. OR". This change is significant because our Department deals with a great number of problems involving the head and neck anatomical regions. The change in name for the Operating Room reflects the general change in philosophy for the Department. New equipment has been ordered for the Operating Room to achieve these new goals.

Future Plans

There are many areas for development in Otolaryngology at Children's Hospital that should make it a leading institution in Pediatric Otolaryngology. A number of areas are being investigated now and their implementation will probably be in the near future.

The identification of deafness in the newborn and early infant has not been organized in a cogent manner. It is hoped that a high-risk registry can be devised for the newborns in whom a hearing loss is probable. These infants will then be referred to our Speech and Hearing Division for early hearing tests using either behavioural or electro-physiologic testing. An infant's hearing should be tested whenever a deafness is suspected. There is no reason to wait until the age of two or three years. In fact, it is preferable to identify and start treating the child by the age of six to nine months.

Dr. Jaffe's interest in congenital anomalies of the head and neck should lead to some organized programs in this area. He is a member of the American Cleft Palate Association and the Department looks forward to expansion into areas where Otolaryngology can make definite contributions in the management of these patients.

Otolaryngology is now represented at the Tumor Conference held in the Jimmy Fund Building. The contributions of Otolaryngology in the management of head and neck tumors is most important since the primary lesion is often detected only with the indirect mirror examinations of the pharynx and larynx routinely used by Otolaryngologists. His familiarity with the head and neck anatomy may soon bring great improvements in the surgical management of these tumors. Already there have been innovative ideas in the surgical management of rhabdomyosarcoma of the middle ear which has long been considered a uniformly fatal disease in children. It is hoped that this new temporal bone resection, performed in concert with the Neurosurgical Department, will bring some survivors from this malicious tumor.

HEARING AND SPEECH DIVISION

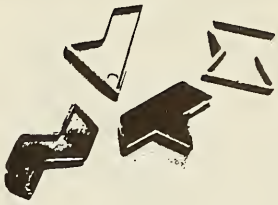
Alan C. Goodman, Ph.D.

Our last report was prepared in February, 1969, for the Centennial Year. The Department has had very few changes in personnel since then, and indeed, since about 1966-67. This is a fortunate circumstance, and because of the relative youth of the professions of speech pathology and audiology, an unusual one in Hearing and Speech Centers. We are pleased by this stability which permits us to hone and refine our clinical services.

The research program, although still small, has contributed some new insights pertinent to speech and language evaluation and therapy. More is in process in those areas as well as in areas of identification and evaluation of infants and children with suspected loss of hearing. Members of the staff have presented research papers at meetings of national and local professional associations and for publication in national journals.

In addition to our clinical and research activities, many of us have remained active in national and local professional and public service affairs. Our objectives in these activities are to improve the quality and availability of services available in schools and via agencies of government for the children and families served by all of us in the profession.

Our hopes and our plans are to continue in all of these directions to foster further improvement in the quality of our services. We hope that we will thus justify the confidence and trust we enjoy from our patients and our colleagues.



Department of Pathology

Gordon F. Vawter, M.D.

After 43 years of devoted service and brilliant leadership, Dr. Sidney Farber has retired as S. Burt Wolbach Professor of Pediatric Pathology at the CHMC, Pathologist-in-Chief, and Chief of the Division of Laboratories and Research of the Hospital. Elsewhere in the report of the Hospital as a whole, his many other contributions will no doubt be acknowledged. The Department is happy that Dr. Farber will continue as Consultant and looks forward to continued close collaborative enrichment through interchange of staff and resources with the Children's Cancer Research Foundation.

That the only service valid for CHMC is that provided at research levels, remains the credo of the department. Among the various implementing resources have been those of the CCRF to which will be added those of the Pediatric Sciences Building where, too, questions generated by the practice of pathology for the care of sick children within the central department may be tested in the laboratory. This combination of traditional and enlarging departmental function and new totality of resources provides exciting challenges to the future appointees to the position of Pathologist-in-Chief and to the Wolback Professorship.

The work of the department has nearly doubled in the past five years, including 4,032 surgical specimens, 279 autopsies and 251 consultations. Required increase in staff has not kept pace with these developments despite appointment of Dr. A. Baez-Giangreco as Assistant Pathologist. Fortunately, Dr. A. Bhaktaviziam has returned to the department for the year as Visiting Pathologist, supported by a grant from the Children's Cancer Research Foundation.

While current income is some 20 percent above projected, only a fraction of department activities is recognizably self-supporting. In the departmental view, its fiscal position would be considerably strengthened were payors explicitly rather than implicitly to acknowledge the central function and role of the department in the hospital, thus enabling needed staff increases. Renewed and enlarged departmental opportunities are inevitable with the appointments of new Chiefs in Dentisty, Otolaryngology, Orthopedics and Neuro-Surgery, as well as Senior Staff in Oncology and Radio therapy. Considerable growth in Ophthalmic Pathology will continue. Centrally located space and other resources will become increasingly departmental priorities. It is appropriate in the departmental view that the Trustees seriously consider the recognition of a Section of Respiratory Pathology, a field showing promise based upon the performance of Dr. Luisa Stigol, last year's von L. Meyer Awardee. Her studies in chronic pulmonary diseases of children (including cystic fibrosis), in respiratory complications of congenital heart disease, and in unexpected infant deaths are proving of interest.

Departmental teaching responsibilities (not detailed below) have included both required and elective courses for first and second year Harvard Medical students, for Simmons College, for various hospital departments, as well as an average of one intra-departmental conference daily. Nine interns and residents have received training, in addition to five affiliates from the Peter Bent Brigham Hospital and Mallory Institute of Pathology.

It would be tedious to list the activities of the Department in support of more than a dozen research projects throughout the city, and in provision of departmental material incorporated in the scholarly reports of others. There were seven publications including two abstracts and one paper submitted for publication by members of the department, with presentations at national and international meetings in addition to those indicated below. In addition to those specifically mentioned elsewhere, investigations have been an analysis of tumors occurring in the first year of life, histochemical studies of tumors and of cystic fibrosis, biochemical studies of tumors of children, of the combined effects of X-irradiation and Actinomycin-D (a combination of treatment previously found effective in tumors of children, notably those arising in the kidney) and studies of experimental chemical carcinogenesis simulating childhood tumors from biochemical, histochemical and immunologic points of view.

The ninth volume of Dr. LeRoy Conel's monumental analysis of the development of the human brain is in preparation. This year he has also published another treatise concerned with evolutionary processes. Important observations on the earliest stages of development or embryogenesis of the heart, have been made by F.J. Manasek, an appointee in Anatomy, Cardiology and Pathology. Recognition accorded these studies is reflected in participation in three seminars, four published reports, three reports in press, and teaching in three courses at the Harvard Medical School. Special attention should also be made of advances in Endocrine and Genito-Urinary Pathology under the aegis of Dr. Hubert Jockin, Assistant Pathologist, and of Dr. K. Murthy, the latter largely supported by the CCRF.

The reports of departmental sections which follow, reflect a traditional commitment to development of special areas of excellence. The reports are presented in chronological order of establishment of the individual section.

THE SECTION ON ORTHOPEDIC PATHOLOGY

Jonathan Cohen, M.D.

This section was concerned with several areas of research and teaching in addition to, and consultation with regard to, diagnosis and treatment of the patients.

During the last year, compared with other years, an exceptionally large number of patients with bone tumors were admitted to this hospital for primary treatment. We believe this increase is in great part due to a more active referral system from outlying communities, rather than to any substantial increase in the incidence of such lesions in our population, although the latter must still be considered a possibility. Although no substantial change in our therapeutic program for such lesions was evident, a consultative arrangement with our Tumor Therapy Clinic personnel proved most effective.

The teaching functions of the Orthopedic section were directed primarily at residents in the Pathology and Orthopedic Departments. Regular sessions involving projection of slides, X-rays, and clinical material were supervised by personnel from this section, and very favorable comments were received on these exercises. The permanent personnel continued work on the following subjects: 1) The interaction between tissues and implanted objects, such as metals, plastics, etc. 2) The investigation of each etiology of specific pathological lesions such as bone cysts, hemangiomas, etc. 3) The pathogenesis of continuing inflammatory response and scarring in chronic inflammation, as studied by light microscopy and electron microscopy. 4) The identification of plastic materials in tissues by microscopic and microchemical means. 5) The detection of iron in hair and the measurement of its concentration in conditions such as muscular dystrophy, etc.

Five articles were submitted to publication.

THE SECTION ON NEUROPATHOLOGY

Floyd H. Gilles, M.D.

The major activity of this unit has centered around the reactions of the developing nervous system to insult. Epidemiological studies of Perinatal Telencephalic Leucoencephalopathy, undertaken by Dr. A. Leviton, have further delineated this entity. Dr. Hedley-Whyte's studies have shown that experimental malnutrition of the neonatal rat retards myelinogenesis in the sciatic nerve.

Dr. H. Mickel has joined the Neuropathology Unit and has appointments in Neurosurgery and Neurology as well. His background in Neurology, Biochemistry, and Lipid Neurochemistry adds a much needed dimension to our current studies of reactions of the developing nervous system.

Support for departmental activities in these areas was provided by a generous grant from the United Cerebral Palsy Reseach and Educational Foundation and by a Mental Retardation Research Program Implementation Grant.

Some alleviation of crowding was provided by the allocation of research space to Drs. Mickel and Hedley-Whyte in the G Building. Space for the training of the large number of Residents and Fellows remains inadequate.

During this period 13 Residents and Fellows have received all or part of their training in Neuropathology in this unit.

Ten articles were published and sixteen are in press or awaiting publication.

THE SECTION ON CARDIAC PATHOLOGY

Richard Van Praagh, M.D.

A submitted resume of the extensive report of this section follows:

From 10-1-69 to 9-30-70, there were nine publications from Cardiac Pathology: three papers, five abstracts and one editorial. 103 congenital heart specimens from Massachusetts and two from New Hampshire were examined. 188 cases from the CHMC Department of Pathology were re-evaluated. SNOP diagnostic coding was completed of 937 cases and the inputting procedure of computerization was begun. Twenty consultations were referred from outside of Massachusetts: USA, 14; Canda, 4; Mexico, 1, and Argentina, 1. The Massachusetts Congenital Heart Registry became operational on October 1, 1969 under the sponsorship of the Greater Boston Chapter of the Massachusetts Heart Association, and Dr. Masahiko Ando, a pediatric cardiologist from Tokyo was the first Massachusetts Congenital Heart Registry Fellow. Sixteen reviews were done for 9 different medical journals. Medical students were taught at Harvard Medical School and at the University of Connecticut. Resident and Fellow teaching was active. Nine meetings were attended and 11 formal presentations were made.

It is noteworthy that each section reporting above represents an area of Pediatric Pathology, particularly enriched by Dr. Farber and delineated by his predecessor Dr. Wolbach.

A nation-wide practical experience, the National Standards required for certification of training in Pathology and the recognized desirability of retaining medical practice in the hands of physicians as contrasted to institutional practice of medicine, require clarification of the position and plans for the Clinical Pathological Laboratories at CHMC in relation to Pathology as a whole.

Department of Psychiatry

George E. Gardner, Ph.D., M.D.

The activities of the Department of Psychiatry of The Children's Hospital Medical Center include individual and group psychotherapy, consultation service to the inpatient and outpatient divisions, professional training of medical and paramedical personnel and research relative to child development and child psychopathology. These interrelated functions and activities are carried out in certain specific areas of the hospital under the direction and supervision of senior members of the Department.

THE CENTRAL PSYCHIATRY CLINIC

The Central Clinic of the Department of Psychiatry concerns itself with the children with whom outpatient psychotherapy, not simply diagnosis and disposition, has been undertaken. These children are generally seen for as long as is demanded by the child's problem, our goals being determined not just by symptomatic relief but also by the need for change within the family. At least one parent and at times both are seen by another therapist during this time. It is this aspect of helping children with emotional problems which provides not only a major service to a special group of children but also is an essential part of the training of residents in psychiatry, pediatrician-trainees in child psychiatry, pre- and post-doctoral trainees in psychology, and student social workers. Treating a child intensively under supervision gives these young professionals a detailed experience, a careful study of a case seen over a long time, a grasp of the intricacies of child development and behavior which add up to a foundation for many kinds of future work. We believe that only with this kind of foundation can our trainees become the skilled therapists, consultants, clinical psychologists and caseworkers of the future.

Our Clinic accepts children for treatment who have a nearly complete range on the spectrum of childhood psychiatric disorders. In the calendar year 1969/1970, 229 children were seen regularly in psychotherapy. In the calendar year 1970/1971, 236 children were seen regularly in psychotherapy. This means that at least one parent was seen as well for each child seen. In addition, other children were actually offered treatment, but declined for various reasons. In each of the two calendar years, the same percentage of the total children in treatment (30%) were assigned as new cases.

Because we serve a children's hospital, we are especially interested in children who are treated in other clinics here, children who have physical illness, a psychosomatic disorder, or who use the hospital as a family doctor. This means that we are willing to see children other child guidance clinics are reluctant to see or simply do not see, and in that sense, too, we provide such a special experience in training that residents from other psychiatric programs seek us out for just this experience. In the academic year of 1968/1969, for example, 66 children were seen in treatment who had some psychosomatic disorder (asthma, ulcerative colitis, epilepsy, eczema, etc.). Forty-five children were seen with major physical illness and an emotional problem; and 31 children with such habit disturbances as enuresis, soiling, pulling out hair, etc. This inevitably involves coordinating our work with other clinics, which is itself a valuable experience in total care and the interdependence of departments and specialties. We see the physically ill child as posing special problems for child psychiatry which make psychotherapy more complex in many cases and involve the families of these children in particular and quite distressing relationships often peculiar to a given disorder. We make no claim to all the answers, and realize that there are many things needing work: the time needed for treatment, the most appropriate form of psychiatric treatment, and teaching pediatricians in this highly specialized age where they can be the most help to a child.

The work of the inpatient psychiatric consultation unit on the medical, surgical and cardiac wards and the Division 72 can be reviewed in its service, training and research components.

Service:

The prime purpose of the unit is the provision of psychiatric attention to those patients for whom it has been requested. Consultations are implemented upon request and the findings are discussed with the medical, nursing and social service personnel concerned. The diagnosis and initial intervention often lead to longer term consultation or treatment. Appropriate referrals are made to local child guidance facilities or to our own treatment clinic.

Those patients whose psychological problems complicate their medical or surgical management are followed as outpatients in the Patient Progress Clinic which meets every Monday afternoon.

Training:

The training of medical, surgical, nursing and ancillary personnel in the psychiatric aspects of pediatric care remains case-oriented. We have presented grand rounds on anorexia nervosa, psychological aspects of hemophilia and problems of drug abuse. We have presented talks at pediatric seminars on student protest and idealism in adolescence. At the request of the house staff, didactic sessions on the reactions of children to hospitalization, conversion reactions and the dying child were presented. In the main, however, teaching remains limited to the case consultation.

A didactic lecture series and a clinical seminar have been presented to the second and first year classes of Harvard Medical School.

Research:

In the last two years studies have been completed on a number of families of children who have been physically abused with the presentation of a paper at the American Academy of Child Psychiatry on the topic. A report of a study of the psychological effect of internal cardiac pacemakers was included in a yearbook of significant contributions to the field of child psychiatry.

A case report of psychotic reaction to open heart surgery has been accepted for publication in Psychiatry in Medicine. A study of child rearing practices will be presented in a book on marriage edited by Morris Fishbein, M.D.

A study of the psychological effects of general anesthesia has been completed as a project with a fourth-year Harvard Medical School student in a research elective.

A study of the psychological adaptation of young adults with cystic fibrosis has been conducted with Harry Shwachman, M.D. under the auspices of the Cystic Fibrosis Research Foundation.

Orthopedic Service (Divisions 26, 36 and 71):

For each of the orthopedic divisions there is a weekly one-hour patient care round which differs in character from one ward to the next. The Division 26 patient care rounds is attended by the charge nurse or a substitute appointed by her, student nurses, play lady or play ladies, the orthopedic social worker, and other social workers, the orthopedic residents, physiotherapists, and visitors of all of the above disciplines. This is an overall patient care meeting where each patient is mentioned by name. Pertinent problems in all areas are discussed very briefly. Little in the way of psychodynamic material is called for; however, each of the patients becomes rather well known over a period of time where orthopedic hospitalizations tend to be long. There is an additional hour to one hour and a half meeting with the orthopedic social worker, during which her work with families with individual children and supervision of her social work students are discussed. This conference is also used for planning and definitive psychiatric disposition for children seen in psychiatric consultation.

The weekly conference on Division 36 is a "supportive device" for the charge nurse and her associates. All of the patients are managed directly by private doctors and the resident doctors are not involved in the actual planning in respect to these private cases. Frequently there are children who need psychiatric consultation and some form of short-term treatment. The nurses will bring this to the attention of the psychiatric consultant and the private physician, the discussion of which may lead to further psychiatric investigation.

On Division 71, over this past year the charge nurse had requested that the psychiatric consultant give a series of clinical seminars regarding psychiatric problems and limited to one or perhaps two patients. These clinical seminars to the nursing staff have become "group therapy" sessions in that the personal problems of the individual staff members as they are involved in the care of specific patients are discussed. This has been a small group of registered and licensed practical nurses as well as nurses' aides. There has been a marked increase in the amount of surgery done from this particular division. Division 71 is becoming a rehabilitation section of the Orthopedic service and much more up-to-date pre- and post-operative surgical equipment is being installed in the near future so that amputations will be done from Division 71 and the total kind of care which is of importance to them will be available. Heretofore, only the prosthetic training on amputees had been done on this ward. At any one time the psychiatric consultant may have from one to fifteen separate patients that he follows actively.

As a result of his interest in the problems of amputees, the psychiatric consultant to the Orthopedic service has written a paper entitled "The Management of Amputations from the Psychiatric Standpoint," the result of which has been that the psychiatric consultant and the social worker see all the patients for amputations pre-operatively and this has become routine on the service. In the cases of tumors which are fatal, these are followed throughout their remaining years, the average being of approximately two years' duration. With the revamping of Division 71, it is safe to predict that the Department of Psychiatry can only play an increasingly important role in prosthetic rehabilitation in the future.

The psychiatric consultant is currently involved in a study pertaining to the reactions of children to leg-lengthening. Leg-lengthening is a surgical procedure consisting of one operation whereby the child has the bone broken and the proximal and distal ends are skewered in a ratchet-type device. Beginning a few days post-operatively one mm. in length twice a day is gained through ratcheting out of the two ends of the bone. In some children psychological reactions develop, and a Draw-a-Person test with variations is administered to these children. The nursing and play lady personnel collect all drawings from the child during the period of active lengthening. These drawings are fascinating in studying the effect of local and rapid growth or elongation and how it affects the total body image.

There are two other projects waiting to be done on the Orthopedic service: The most important is the possible documentation of idiopathic scoliosis as a "psychosomatic illness." The hypothesis that hysteria of the musculo-skeletal system is, in all probability, a much more fundamental type of hysterical process than other types of hysteria would be another study of interest.

Tumor Therapy Service (Division 28 and Jimmy Fund Outpatient Building:

Consultation to this service has been a relatively recent one in the past two or three years. For the most part the time of the psychiatric consultant is spent on Division 28 and the fixed hours of involvement include a group meeting with the play lady, social worker, nurses, aides and residents, supervision for a parents' group, and some consultation time with children and/or their families.

TRAINING OF CAREER CHILD PSYCHIATRISTS

The Department of Psychiatry at The Children's Hospital Medical Center offers a two-year training program in child psychiatry in collaboration with the Judge Baker Guidance Center. Case material at the hospital is derived from the Central Psychiatric Clinic, the Consultation Unit of the Outpatient Department, the Inpatient Services, the Adolescents' Unit, and affiliated agencies such as Family Health Center, Parents' and Children's Services of the Children's Mission, etc. A Mental Retardation Unit provides the opportunity for training in this important area. The Judge Baker facilities include an outpatient child guidance clinic, the Manville Residence School and Day School, and the Pre-School Children's Unit. Trainees spend one day a week in the Boston Juvenile Court Clinics. The combined resources available provide a very wide spectrum of experience in all aspects of child psychiatry.

The first year of training stresses the understanding of normal child development and techniques of interviewing, evaluating and treatment of children. Training in the second year provides an intensive study of the psychopathology of childhood. In this year the program is flexible and through a wide range of electives makes it possible for the training to be individualized to the particular needs and interests of the resident. The program is balanced in terms of didactic teaching, seminars, clinical work and individual supervision. The community aspects of psychiatry are emphasized throughout by means of an active consultation program whereby the resident learns through supervised work the techniques of psychiatric consultation to various community agencies.

From 7/1/69 to 6/30/70, there were three first-year residents who completed their first year of training in child psychiatry and five second-year residents who completed their second year of training in child psychiatry. In addition, six psychiatric residents from other training programs affiliated with the Department of Psychiatry for part-time training in child psychiatry, spending up to 1 to 1 1/2 days a week at The Children's Hospital Medical Center.

Recent changes in policy by the American Medical Association and by the National Institute of Mental Health has given approval for the acceptance of trainees into programs of training in psychiatry directly after graduation from medical school, with elimination of the requirement for prior internship. As it is now also possible for individuals to take their training in child psychiatry before completion of at least two years in adult psychiatry (as previously required), we find ourselves accepting trainees for the first time directly out of medical school.

Certain special problems in training have been anticipated as the result of this new policy. Much more time has to be allocated, particularly in the early months of training, to the teaching of basic fundamentals of psychiatry. Clinical responsibility cannot be allocated as quickly to the novitiate as to the more experienced resident who comes after a year of internship and 2 to 3 years of adult psychiatry behind him. In a hospital or clinic service, expectations are necessarily reduced.

During the first weeks of training the new residents are given the opportunity to spend some time in observation of normal children in a community nursery school and also observe staff psychiatrists interview parents and children in diagnostic evaluations.

With regard to the acceptance of trainees directly from medical school, it is too early for us of course to comment on the wisdom of such a course. We have accepted other applicants for next year who are either directly out of medical school or who have had no previous psychiatric training. We had had, we must add, however, some experience in training such people in the past - - namely, pediatricians who come to the Department of Psychiatry for one year of special training in Child Psychiatry for Pediatricians. But here the goals are somewhat different.

Electives:

As a teaching hospital of the Harvard Medical School, we offer elective courses in child psychiatry to medical students both from Harvard Medical School and other medical schools throughout the country. There have also been residents in pediatrics both within the Children's Hospital as well as from other hospitals who elect to spend a month or more in the Department of Psychiatry. Students on electives come for a period of one or two months and are given a broad view of the emotional and social adaptation of children, utilizing the facilities of The Children's Hospital Medical Center, the Judge Baker Guidance Center, and the Boston Juvenile Court Clinic. Through observation and participation, the students are shown the fundamentals of diagnostic evaluation, consultation, and interviewing techniques under close supervision by staff psychiatrists.

Seminars:

In addition to seminars in childhood psychopathology and development, this year we have set up a new demonstration seminar - - Diagnostic Evaluation and Interviewing Techniques - - conducted by John Blitzer, M.D., a child analyst and psychiatrist. This is a two-hour weekly session consisting of a didactic introduction, followed by demonstrations by Dr. Blitzer of actual interviews with parents and children observed by the participating first-year residents. Time is taken to discuss the interviews in detail. More recently residents have begun to carry out diagnostic interviewing under the observation of the seminar leader and other residents. This has proved to be a valuable teaching tool and will be continued through the year.

Division 72 - - Prolonged Care Psychosomatic Service:

Mention should be made of a division in the hospital which is of considerable importance to the Department of Psychiatry and has been utilized extensively in the training of our residents. This is Division 72 of the hospital. Although it has been operative for some time, it has under-gone reorganization recently. Its administrative, treatment and teaching relationship to the Department of Psychiatry has been defined and clarified.

Division 72 is a 20-bed unit which accepts patients from infancy to late adolescence who require long-term medical and/or psychiatric management. The infants and younger children are usually either infants with failure to thrive syndrome or battered children. Many of the older patients have psychosomatic problems such as asthma, ulcerative colitis, anorexia nervosa, etc. A number of children with conversion symptoms have been treated in this unit, as have children with such problems as school phobia. The division functions in many if not in most respects as a psychiatric ward.

The division, in addition to medical staff and nursing service, has a classroom with teaching for all grades through high school provided by teachers from the Boston Public School System. There are also recreational facilities, a full-time Director of Recreational Services, and male aides as assistants. Interns and residents from the medical services rotate on this service for a period of six weeks.

The administration of the division is Berry T. Brazelton, M.D. a pediatrician with considerable background in child psychiatry. Although the division is regarded as part of the medical service, functionally it is run on a fully collaborative basis with the Department of Psychiatry which provides psychiatric services at several echelons. Eugene Piazza, M.D., staff psychiatrist, shares administrative responsibility with Dr. Brazelton as well as supervising the psychiatric service to the division. Conferences, ward rounds and teaching are provided by Doctors Galdston, Hughes and Benaron from the Department of Psychiatry.

This unit is particularly useful for training of our residents in the long-term treatment of hospitalized patients and necessitates their working collaboratively with so many other professional people concerned with the care of these patients, pediatricians, nurses, teachers, aides, etc.

Aside from the immediate training of our own residents, the unit provides a unique opportunity for the contact of psychiatry with visiting staff, house staff, nurses, medical students, and for very worthwhile teaching, in both directions, at this interface.

Community Psychiatry:

The training program has continued to emphasize the need for a balanced program of training in community psychiatry as well as individual psychiatry. This is accomplished through several means.

(a) *Training in Agency Consultation:*

A series of introductory seminars are given at the beginning of the year to all first-year residents on the subject of community agencies. More intensive training, conducted through 1-2 years, is offered as an elective, with didactic seminars, group supervision and field work wherein the trainee is assigned as a consultant to a community social agency, school or similar institution.

(b) *The Boston Juvenile Court Clinics:*

The equivalent of one day a week is spent by the resident in his first year of training in the Court Clinics. Through conferences and supervision he learns to deal with the multitudinal problems - - social, psychiatric, cultural, legal - - which present themselves here. In addition to consultative and therapeutic services, there is the added experience of working closely with the Court, probation officers, teachers, etc. As most of the children seen in this Court come from the inner city, this exposes the trainee to the impact of a way of life with which he may not have been, but should be, familiar.

(c) *Project Youth:*

Paul Redstone, M.D., in his second year of residency, is spending the equivalent of 1 1/2 days a week in Project Youth under the auspices of the Roxbury Comprehensive Community Health Center. This agency is under the direction of the community itself. He works closely not only with groups of children and young people, but also meets with groups of parents and active leaders in the community. His work here is supervised by a senior psychiatrist who has been working with community.

The Psychiatric Training Program for Pediatricians in child mental health principles and practice is organized to train pediatricians at all stages of experience in the psychological aspects of normal development and the psychopathology of childhood. Graded levels of instruction are geared to the training level of the pediatrician and the program is extended to all levels of pediatric house officers and to fully trained pediatricians as well. A gradually increasing involvement begins with teaching from ward consultation and continues with the supervised clinical evaluation of the developmental and psychological problems encountered at the Medical Outpatient Department. The curriculum culminates in a full-time one-year program for selected pediatricians supported by a National Institute of Mental Health Training Grant. This program was designed to offer comprehensive training and experience in the social, emotional and psychosomatic problems of children and their families to pediatricians who prepare for a career of teaching and research. During the academic year of 1969/1970, there was one pediatrician-trainee enrolled in this program and there are two candidates for the year 1970/1971.

The training program stresses comprehensive mental health care and the role of the pediatrician as an integral member of the community mental health effort. The acquisition of specific consultative, diagnostic and therapeutic skills is related to the total care of the child and to collaborative use of community mental health resources.

1. *Medical Outpatient Department Psychiatric Consultation Service:*

The psychiatric consultants attend case conferences twice a week where the house officers of the MOPD present the cases in need of physician-to-physician type of psychiatric consultation leading to disposition. The cases which deserve direct psychiatric consultation are interviewed together by the pediatrician and the psychiatrist. This consultation serves the double purposes of clarifying the diagnosis and offering a teaching experience to the pediatric resident. The patient remains under the pediatrician's care.

The Psychiatrist-in-Chief and members of the teaching staff meet with the medical house officers once a week for a conference to discuss cases that seem to the pediatrician to have paramount or associated psychological problems. The primary aim of this seminar is the instruction of pediatric residents relative to those cases which will appear frequently in their future hospital or private practices, with the goal of sharpening their diagnostic skills and judgment. It is our hope that with the help of this training, the pediatrician will become an effective mental health arm in the community.

2. *Psychiatric Consultants:*

The Department of Psychiatry provides consultations to several of the specialty clinics of the hospital. Dr. Ludwik Szymanski serves as the psychiatrist on the Developmental Evaluation Clinic's diagnostic teaching and research team and the work at this clinic is his major area of concentration. Dr. Michael Hughes serves as the consultant to the Medical Follow-Up Clinic; Dr. Wells Shambaugh to the Renal Clinic and the Martha M. Eliot Health Care Center; and Dr. Chester d'Autremont to the Department of Neurology, Seizure Unit and the Maternal and Infant Health Study.

3. *Adolescents' Unit Psychiatric Consultation Service:*

Under the direction of Dr. William Crowell, this division has been operating for several years as a screening, intake and diagnostic unit. A fourth essential function is that of definitive disposition as a complement to the above three functions. A fifth function is the consultation to the Adolescents' Unit through which much of the intake originates. For the most part, the adolescents accepted for definitive evaluation and disposition come from the Adolescents' Unit; however, many come from direct referrals from the Emergency Clinic, the wards in the hospital, the outpatient clinics in the hospital and completely outside referral sources, i.e., partents, teachers, clergy, local family physicians, etc. A few adolescents are self-referred. The working arrangement with the Adolescents' Unit is such that chart formation and physical examination can be carried out before or after the child is seen in the Department of Psychiatry for diagnostic evaluation, depending on the rapidity with which the evaluation needs to be done.

In the past two years 120-130 complete evaluations have been performed. Dr. Crowell supervises the residents and medical students on electriv at this service. Additionally, there is a conference each week with the Adolescents' Unit trainees and various visitors. The purpose of this conference is to refer adolescent patients for psychiatric evaluation, through it has also become a teaching seminar for interviewing techniques and obtaining psychiatric histories.

4. *Psychiatric Diagnostic Outpatient Clinic* serves first of all The Children's Hospital Medical Center but it is also open to referrals from outside agencies. The bulk of the evaluations is done by psychiatric residents under the supervision of staff psychiatrists. There were approximately 600 sessions for diagnostic evaluations performed during the year of 1969/1970.

CLINICAL PSYCHOLOGY

As of December 1970, 27 full or part-time staff psychologists were employed in The Children's Hospital Medical Center in a variety of service, training or teaching, consultative, and research functions. The appointments of all these psychologists were approved by the Chief Psychologist and the Psychiatrist-in-Chief. Although their service functions extended throughout the Medical Center, 12 of these psychologists (the equivalent of approximately 8 full-time staff) were employed directly in the Division of Psychology of the Department of Psychiatry and were paid by that Department. The other 15 full or part-time psychologists engaged in service or research capacities, were paid from other sources and included psychologists in the Mental Retardation Unit, the Seizure Clinic, the Maternal and Infant Health Study, part of a collaborative study of Cerebral Palsy, Mental Retardation, and other Neurological and Sensory Disorders of Infancy and Childhood, and in a large-scale research study ("Neuropsychological Study of Spatial and Temporal Organization of Humans").

1. *Service:* Staff psychologists have functioned, along with psychiatrists and psychiatric social workers, as psychotherapists for both children and their parents within the Department of Psychiatry. Psychologists have been solely responsible for the unusually large amount of diagnostic psychological testing of outpatient and inpatient children throughout the Medical Center, not only within the Department of Psychiatry but also in the Medical Outpatient Department, the Adolescents' Unit, all inpatient divisions, Mental Retardation Unit, Seizure Clinic, Cerebral Palsy Clinic, Outpatient Neurology Service, PKU Clinic, etc. Child patients presenting difficult diagnostic problems are frequently referred here for further diagnostic testing after being tested in schools, community clinics, etc. The diagnostic testing service function extends beyond the actual testing of children and adolescents; for example, psychologists frequently meet with parents to discuss test results and recommendations and become involved with schools and child care agencies in making recommendations and educational or psychological plans for a particular child.

2. *Training* has been a major function of psychologists for many years and has operated primarily at graduate and postgraduate levels At the pre-internship level, we have had, for the past two training years, for example, graduate students from Harvard's Department of Social Relations, from Boston University, from Clark University and from Boston College.

The pre-doctoral internship program represents a major training effort. Supported by the National Institute of Mental Health in terms of minimal stipends for the trainees and partial payment of some of the trainors involved, it attracts applicants from all over the country, all of whom are in their third or fourth year of graduate study toward a doctorate in clinical psychology. The number of applicants exceeds by far the five traineeships we can offer. A concerted effort is made to select interns beyond the local universities; for example, in the last two training periods, we have had interns from the universities of Indiana, Iowa, Michigan State, North Carolina, as well as from Harvard, Boston University, and Clark. Applicants must be enrolled in university programs approved by the American Psychological Association. Our training program is approved not only by the National Institute of Mental Health, but also by the American Psychological Association and by the American Association of Psychiatric Services for Children.

The program is a concentrated one. Core training includes: psychotherapy with children and parents; diagnostic testing of children; diagnostic interviewing of children and their families; participation in diagnostic and therapy conferences; seminars in psychotherapy, research, clinical issues and in group dynamics; periodic attendance at ward rounds. Optional training includes assignments to any of the following: 24-hour-a-day Emergency Psychiatric Service, ward consultation service, a residential treatment center for disturbed boys, a school consultation program, a satellite clinic in an underprivileged area, a group therapy program for ghetto children.

The post-doctoral program, also partly supported by the National Institute of Mental Health, is conducted jointly with the affiliated Judge Baker Guidance Center. Trainees can elect to stay for a two-year period. Currently we have the full complement of trainees, two at the first-year level and two at the second-year level, all of whom have doctorates in clinical psychology. Advanced training in psychotherapy and diagnostic work are central training issues, but the post-doctoral fellow has several options for additional clinical or research specializations. Grant-approving site visitors have commented in the past that the combined training facilities of The Children's Hospital Medical Center and the Judge Baker Guidance Center offer to the post-doctoral fellow in clinical psychology perhaps more variety and scope in training than any other program in the country.

Beyond the teaching involved in the training of interns and fellows in clinical psychology, staff psychologists engage in many other teaching and consultative activities within the Department of Psychiatry and throughout the Medical Center as well. The following are illustrative: introduction to the rationales for psychological testing and the use of test results by other professionals by way of lectures, observation, and videotaped sessions, to psychiatric residents, medical students, residents in Neurology and in the Medical Outpatient Department, staff and student nurses, social work staff and students, etc.; participation in the annual continuing education seminar for physicians conducted by Harvard Medical School as well as in the annual meeting conducted by the Adolescents' Unit for physicians from around the country interested in adolescent medicine; periodic lectures on a variety of psychological topics to nurses at staff and student levels; participation in ward rounds, which houses patients who require long-term care or who have psychosomatic problems; a teaching and consultative role for child care workers on Division 72; lectures to physiotherapists regarding children with cerebral palsy; lectures to dietetic students regarding children with phenylketonuria; an active teaching and consultative function in the Adolescents' Unit, for example, individual case conferences with physicians, emergency consultations, weekly group case conferences, periodic lectures on adolescent syndromes; participation in the Medical Diagnostic Clinic Conferences in the Medical Outpatient Department; specially focused diagnostic conferences with psychiatrists and psychiatric social workers in the Medical Outpatient Department, etc.

3. *Research:* Ongoing research will be presented more exhaustively in a later section. Reference should be made, however, not only to the earlier cited research (for example, the collaborative research done by a team of psychologists in the Maternal and Infant Health Study) but also to research being done by psychologists in the Mental Retardation Unit, in the Seizure Clinic, in the PKU Clinic, in the Medical Outpatient Department. Two of the senior psychologists in the Department of Psychiatry, after many years of research on the tasks of emotional development in children by way of an original and specially devised test instrument, were notified recently that a major publishing company will publish the test instrument, the underlying theory, and the normative data. To summarize, the psychology personnel in the past two years have published 19 articles in creditable scientific journals.

Finally, these additional functions of staff psychologists should be reported: teaching or clinical appointments at Harvard Medical School, Boston University, Boston College, State College of Boston; committee involvement in state and national professional organizations, for example, American Association of Psychiatric Services for Children; membership in a multidisciplinary committee writing a grant proposal for the training of Clinical Scholars in Family Medicine; volunteer consultative and service functions at our satellite clinic (Martha M. Eliot Family Health Center), a clinic located in an underprivileged area; membership on a committee involving Boston School children; continuing contacts with the Departments of Education and Mental Health as to the implementing of special opportunities for special education (Chapter 750; perceptually-handicapped children programs); at the request of the American Psychological Association, chairmanship of site visiting teams regarding the approval of installations for training of interns in clinical psychology; volunteer service and clinical supervision (group therapy) in the black community; and participation in post-graduate education conducted by the Massachusetts Psychological Association; community education by way of lectures to parents, teachers, tutors, etc.

SOCIAL SERVICE IN THE DEPARTMENT OF PSYCHIATRY

The social work staff in the Department of Psychiatry is comprised of 11 Master's degree social workers, 8 of whom are employed on a part-time basis, the equivalent of 6 1/2 full-time workers, whose work loads are assigned according to the capabilities and special interests of each. The primary responsibility of these workers is to the Central Psychiatric Clinic where they provide weekly casework treatment of parents whose children are in psychotherapy in the Department. This generally involves us in intensive casework with parents, the purpose and goals of which are to help them to understand the emotional stresses and needs of their children, to enable them to give positive support to the psychotherapy their children are receiving, and to help them to modify some of their own attitudes and behavior which may be contributing to the problems of their children.

In addition to our focus on the child's psychological disorder, we necessarily consider other important aspects of his life such as his school adjustment, his educational functioning, his relationship with peer groups and his play interests. This brings us in contact with a variety of community agencies that have much to contribute to the growth of the child and to his healthy development.

The social workers in the Department of Psychiatry also participate in interdisciplinary diagnostic evaluations and in consultation to the Medical Outpatient Department and the Adolescents' Unit in regard to cases seen in Psychiatry. One social worker has been assigned major responsibility for all relationships with the MOPD, particularly in regard to telephone intake screening. Another is involved in consultation to the residents in the Adolescents' Unit and, in addition to telephone intake screening, assists in coordinating, scheduling and evaluating the parents of adolescents referred to the Department of Psychiatry for evaluation.

Telephone intake screening, we fell, is a major service to the patient, the hospital and the community. Much time is spent sorting out with the family the nature of the problem and every effort is made to refer the families to the most appropriate resource, whether in or out of the hospital.

In regard to diagnostic evaluations, several new approaches are being attempted this year, including a training program in which a senior staff psychiatrist and social worker conduct diagnostic evaluations which the residents observe and/or participate in, after which a case discussion follows; family diagnostics carried out by a team of psychiatrist and social worker, in which all members of the family are asked to participate; and an attempt at finding new methods of evaluation carried out by a third interdisciplinary team.

Staff social workers who are interested in the direct treatment of children do so under psychiatric supervision.

Training and Teaching: It has always been a practice for all social workers to have continued supervision, two hours a week for beginning staff workers, and an hour a week on a consultation basis for the more senior members of the staff. In addition, senior and junior social work staff participate in two separate advanced casework seminars led by a member of our staff who is on the faculty of the Simmons School of Social Work.

The social workers in Psychiatry are involved in training five social work students from two schools of social work. For their continued enrichment, as well as our own, we conduct formal monthly teaching seminars in which we have recently begun to invite guest speakers from the hospital or from the community who enhance our learning and lead discussions related to our own case problems.

All pre- and post-doctoral psychology trainees are involved in treating at least one set of parents, functioning as do the social workers in the clinic. Group supervision of this work is provided by senior staff social workers.

The psychiatric social workers meet regularly with medical and social workers both in administrative as well as educational meetings. All the chief social workers meet weekly to discuss general administrative problems of the Department as a whole. Social workers from Psychiatry are represented on all hospital social service committees.

Psychiatric social workers are on emergency call from 9 a.m. to 5 p.m. to participate in emergency evaluations with psychiatric residents. They also rotate on night and weekend emergency call with all the hospital social workers.

Outside the hospital, Mrs. Singer for the past two years has been a member of a committee studying the "excluded child." She has also acted as a liaison between the Martha M. Eliot Health Center and our Department.

For some years, social workers have conducted a camp planning program. This includes helping therapists select an appropriate camp for a child as well as locating funds for his placement. Camp plans are worked out for 40-50 children in the Department of Psychiatry each year.

The sequential organization of non-nutritive sucking in young infants has been analyzed and the sucking patterns of normal and high risk infants compared. A parallel study of nutritive sucking, with special emphasis on the phase correlation among various parameters of sucking (positive pressure on the nipple, negative pressure or sucking in the mouth, swallowing and breathing) is under way; its aim is also to identify infants with minor neurological disturbances who show no gross neurological signs. Dr. Theodore Dreier is analyzing non-nutritive sucking patterns by more sophisticated statistical techniques (especially by "time series" analysis). The study again emphasizes the comparison of normal infants and infants born to "high risk" mothers.

In collaboration with a member from the Department of Clinical Neurophysiology, the effects of "white noise" on the infant's state and behavior have been studied. Our purpose was to determine (1) how white noise influences the state of the infant, by comparing the evoked cortical response to somato-sensory stimulation with and without white noise and (2) to determine whether behavioral effects of white noise are observed primarily at the sensory or the motor "end" of the response system. White noise was found to alter the configuration and amplitude of the cortically evoked somato-sensory response.

A cross-sectional study on the occurrence of "strangeness anxiety" was completed. The results are suggestive, but the sample was small (20 infants from 4-9 months), and the methods were not entirely acceptable. "Strangeness anxiety" refers to the observation that at around 4-7 months many infants will respond to the familiar face of the mother with negative affect (cry face, gaze aversion, whimpering or crying) when the familiar face is distorted in a minor way (e.g., when the mother wears sun glasses or a bathing cap). Such adverse response can only be provoked when the distortions of the familiar face are minor and as long as they are novel.

Animal Studies — A comparative study of sucking patterns in hand reared mammals has been completed. From the findings it was concluded that some organizational features of sucking behavior are unique to the human species and that within limits, rates of nutritive sucking are specific to families of mammals.

The development, pedigrees and individual variability of nutritive sucking rates have been tested in a pure-bred herd of Nubian goats as an experimental observation in behavior genetics The results serve as a preparation for systematic investigation of physiological factors influencing the rate of stereotyped rhythmical motor responses within one species which shows very stable sucking patterns.

Studies of School-age Children — For the past 1 1/2 years, Drs. Hurwitz and Wolff have undertaken investigations on sex differences in styles of adaptation of normal males and females. The rationale,for these studies is Broverman's finding that healthy adult males are generally superior to females in tasks requiring "spatial restructuring" (spatial abilities in MacFarlane-Smith's terms, restructuring style in Broverman's terms), whereas females generally are superior to males on tasks requiring rapid adaptation to mechanical tasks and on the "automatization functions." Our findings indicate that competence in maintaining stable voluntary motor rhythms are directly correlated with the automatization style as defined by Broverman and is therefore perhaps also associated with sex differences in cognitive style.

(a) To date, 300 normal American school-age children from 6-12 have been studied on the automatization tasks and for performance in voluntary motor rhythms. Strong and consistent sex differences were found at every age from 7-10 on measures of sensorimotor rhythms and automatization style; a gradual decrease in this difference was found as the children reached puberty. The sample of normal children tested on spatial restructing tasks is still too small to permit conclusions concerning sex differences.

(b) A comparable sample of 100 Japanese school children has been studied in the same way and with similar results. While sex differences in general are the same as those found in the United States, there are also noteworthy differences in sex differences across mating groups, whose theoretical significance has not been ascertained.

(c) Closely related in method and conception to the above studies are comparison of normal children and children with (1) various learning disabilities, (2) neuropsychological disturbances, and (3) with children who have been adjudicated as juvenile delinquents. Forty delinquent boys have been tested on the automatization and spatial restructuring tasks, for general intellectual attainment, and examined by a short version of the Lincoln-Oseretsky Test of motor abilities. Our interest in this population stems from an earlier finding that incidence of minor neurological dysfunction is much greater in a population of juvenile delinquent boys than in normal populations. A second study indicated that many juvenile delinquent children score below the fifth percentile on the Lincoln-Oseretsky Test for motor abilities. On the assumption that many children and adolescents in conflict with law enforcement agencies suffer from various neuropsychological disturbances, we are determining the precise nature of sensorimotor and cognitive deficits in this population.

(d) In parallel, the entire population of 35 children from the Manville School of the Judge Baker Guidance Center has been studied by a similar design. The school population is composed of severely disturbed neurotic and pre-psychotic children, many of whom have difficulties in gross and fine motor coordination, show evidence of minor neurological dysfunctions.

(e) In collaboration with the Department of Neurology, we have completed a double blind pilot study on the effects of intravenous injection of Ritalin and amphetamine on the automatization functions and EEG patterns of hyperactive children. Testing after intravenous administration was followed by oral maintenance doses of the same drug, and testing was repeated three weeks later. While the sample was small, the results indicate that selected patients who show a dramatic improvement in performance on the automatization functions when given intravenous Ritalin and amphetamine, also show marked clinical improvement on oral medication as reported by parents and teachers. These changes in turn appear to be correlated with specific changes of the EEG. A more definitive study based on a better selected population is planned.

(f) During the year Dr. Annette Silbert began to study biological basis for behavioral sex differences, by testing children who had been exposed to an abnormal endocrine environment before birth or who because of other organic factors (abnormal chromosome complement, abnormal variations in sex steroid environment, etc.) have undergone ambiguous sexual development. The study emphasizes children whose condition can be partially ameliorated by hormonal replacement therapy, and who can be tested before and after the onset of treatment.

(g) Dr. Stanley Walzer is continuing his longitudinal studies of male infants with Klinefelter's syndrome. Naturalistic observations in the home and detailed interviews with the mothers of such children are supplemented by intermittent systematic psychological testing. The infants are identified at birth through a mass survey of karyotypes in phenotypically normal male infants and identified children are followed longitudinally over the next five years. In addition to infants with Klinefelter's syndrome, Dr. Walzer is identifying a wide range of children with other chromosomal abnormalities who are phenotypically normal, some of whom are also studied in detail.

Cross-Cultural Studies — In the past two years Dr. Wolff has coordinated "cross-cultural comparison of infant-mother interactions being carried out simultaneously by trained physicians in the United States, Korea, Taiwan and Japan. The aim is to analyze differences in movement patterns and postures which characterize the "quality" of the mother-child interaction in different cultures; observations emphasize the movement patterns and postures during everyday transactions of feeding, bathing and diapering.

Psychopharmacology — Dr. Schoenfeld, formerly of the Department of Pharmacology, has recently joined our research staff and is currently engaged in various experimental studies to determine the effects of neuro-humoral agents on the behavior of experimental animals. Our aim is to collaborate on experimental models that can serve as analogues to specific clinical conditions in human patients who show various behavioral disturbances.

On January 1, 1971, the Department of Psychiatry welcomed its new Psychiatrist-in-Chief, Julius B. Richmond, M.D., formerly Professor of Pediatrics and Dean of the Upstate Medical School, Syracuse, New York. Dr. Richmond is a nationally recognized leader through his published research in respect to child development and child care. In addition, he is recognized both here and abroad as a leading medical statesman of our time. The members of the Department of Psychiatry and the entire staff of The Children's Hospital Medical Center are indeed fortunate and proud to welcome Dr. Richmond!

Department of Radiology

Edward B.D. Neuhauser, M.D.

During the period covered by this report, the Department of Radiology has made many gains and has suffered a sad loss.

In August, 1969, after a long illness, Doctor Martin Wittenborg died. He had devoted 22 years, his entire professional life, to Pediatric Radiology and the Children's Hospital. A wise and compassionate teacher and physician, the impact of his personality will be long remembered.

After a decade of working in very cramped quarters, the X-Ray Department has at last been able to undergo important expansion, taking over the major portion of the Farley Corridor. All of the Radiologists' offices have been moved to the corridor as have the secretarial services. A small but very useful class room has been created and on the door there is a bronze plaque denoting it as the Wittenborg Radiology Conference Room. An informal colored photograph of Dick hangs on the wall.

The removal of offices to the corridor provided the opportunity to remodel the working department with the creation of two new X-Ray rooms and an area devoted to the film interpretation of children with neuroradiological problems and cardiovascular diseases.

The Division of Nuclear Medicine for some years operating under the aegis of the Department of Radiotherapy has moved into colorful and spacious reconstruction of the second floor of the Bader Building, an area formerly occupied by the Polio Clinic. Nuclear Medicine is back in the fold as a part of Diagnostic Radiology. A joint program in Nuclear Medicine has been created with the division at the Peter Bent Brigham Hospital under the leadership of Doctor James Adelstein. Doctor Salvador Treves has recently been appointed the first full time physician in Nuclear Medicine at The Children's Hospital Medical Center. It is expected that this joint program will be effective indeed, but a description of its full impact must wait for the next Annual Report.

There have been important additions to the Staff of the Radiology Department so that it is now one of quite extraordinary strength. After a year spent in Dusseldorf, Germany, Doctor Detlef May, has returned to the Hospital and is currently carrying out the vascular and cardiovascular radiology with skill and enthusiasm while Doctor Kenneth Fellows takes a year's leave of absence as Max Kade Fellow at the Children's Hospital. Hamburg-Eppendorf where he is working with Doctor Arnold Lassrich. Professor Lassrich is one of the renowned Pediatric Radiologists of Europe and Doctor Fellows should benefit greatly from his teaching. At the same time Ken is taking to our European colleagues unique skills that are serving to introduce vascular radiology in infancy and childhood to a number of clinics. Pediatric neuroradiology has attained a level of competence never before achieved at the Children's Hospital with the return of Doctor Roy Strand after two years of Fellowship at the Hospital for Sick Children in London and the Ulleval Hospital in Oslo. He is knowledgeable, technically skillful, and a lucid and effective teacher. The other permanent members of Staff, Doctors Harris, Griscom, and Wilkinson continue to be busy and productive.

During the past several years the Department has been fortunate to be able to offer Fellowship status to a number of Radiologists from overseas. From the Department of Professor Middlemiss at the University of Bristol in England came Doctor David Martin for one year. After another year at the Hospital for Sick Children in Toronto, he will be returning to becoming a Pediatric Radiologist at the University of Bristol. Doctor Jurgen Spranger from the University of Keil spent almost eight months with us devoting the major portion of his time to a study of the bone dysplasias, a most confused and neglected subject but one of particular importance today because of the increasing need for genetic counseling. Doctor Spranger's Atlas of bone dysplasias and congenital malformations which he began while serving as a Fellow at The Children's Hospital should be published this coming year. A third Fellow still with us is Doctor Abdulla Kenanoglu, Professor of Radiology and former Dean at the Haceteppe University Medical School in Ankara. He is on a two year sabbatical leave from that University so will be with us for some time to come.

The Department has been particularly fortunate in having a series of able and innovative Administrative Assistants. The first Miss Susan Walsh, then Mr. John Bracken, and currently Mr. David Whiting. They have all worked diligently on both minor and important problems of the Department including patient flow, personnel, fiscal affairs, coding, filing, and planning. Each has been immensely helpful in making available to the Medical Staff more time for teaching and scientific pursuits.

The School of X-Ray Technology, under the leadership of Miss Cecile Godderidge has flourished. Currently there are nine attractive and enthusiastic students. The first class after a two year combined program with Northeastern University will graduate shortly.

Many people in the Department deserve the praise and thanks of the Hospital for their loyalty and dedication and one would like to name each of the more than 85 members of the Department. A few must be cited, Miss Sandra Clarke, Chief X-Ray Technologist, has been an extraordinarily effective and buoyant cheerful leader. She leaves us now for marriage and will be greatly missed. Mr. James Conway in charge of filing and reception maintains strong leadership, his calm approach and keen eye has completely done away with the chaos that so often occurred in the past. Eric Hammond, Charles Spear, and Hernan Machicado of the Department's engineering service continue to amaze us with their ability to keep old equipment running, to plan for and install new equipment, to fabricate parts and create new circuitry and at the same time to be helpful in many other areas of the Hospital. We are indebted to these members of the Department but to many others too.

The service or workload of the Department has undergone interesting changes in the past few years reflecting as it does increasing activities in the Emergency Departments or diminishing activities elsewhere. Many more patients are seen in the evening and on weekends then ever before necessitating greater Staff coverage for these periods. Even more impressive is the increase in the complexity of examination so that the statistics which are appended are in a sense not reflective of the true work load. For example, a two film examination of the chest rarely takes more than ten minutes whereas a complicated neuroradiological procedure may take two to four hours. We hope in the future to be able to provide in addition to the usual statistical figures some time-complexity-staff involvement factors that may be more meaningful.

Pediatric Radiology seems more exciting and viable than ever and we will look forward to accomplishments in the future.

STATISTICS **FISCAL 1969-1970**

	FILMS	*EXAMINATIONS*	*VISITS*
DIAGNOSTIC X-RAY:	162,568	70,266	57,882
	ISOTOPE SCANS		
NUCLEAR MEDICINE:	1,485		
	TREATMENTS	*PATIENTS*	
RADIOTHERAPY:	4,114	3,345	

Department of Surgery

N. Judah Folkman, M.D.

During 1970, 3,800 operations were carried out on the General Surgical Service. That nearly everyone of these children recovered from illness is a tribute to the high quality of care given by all of the people who cared for them. But this number does not say anything about the efforts of the members of the Department of Surgery to improve this care or to teach it to others. These efforts are summarized as follows:

IMPROVEMENTS IN PATIENT CARE

During 1970, Dr. Levey carried out the first successful bone marrow transplantation at the Children's Hospital, and set up a tissue typing laboratory to match patients for transplantation. Also for the first time a patient with Goodpasture's syndrome, was successfully treated in this hospital by bilateral nephrectomy. In addition we are now producing our own anti-lymphocyte serum for use in transplantation. The first hemodialysis at Children's Hospital was done this year and a Hemodialysis program has been started.

Heparin impregnated silicone catheters were used by Dr. Folkman in six patients who required prolonged intravenous catheters in the umbilical vein or saphenous vein. Dr. Filler was primarily responsible for the intensive care unit which opened this year on Division 24 and he also began a major clinical study of the use of a tiny pH probe to monitor muscle pH in intraoperative and postoperative periods. Perhaps the most interesting innovation was the development of a new operation by Dr. Kelly and Dr. Eraklis for penile advancement in children afflicted with extrophy of the bladder and severe penile shortening. No operation has been available previously for these unfortunate children and the three cases treated so far have had a successful outcome. An ambulatory surgical unit was opened this year, and up to twelve operations are performed there each day.

EDUCATION

a) *Harvard Medical School.* Five members of the department served on the Admissions Committee this year, contributing two afternoons weekly from October to January. In addition to the Harvard students taking our clerkship every month and the group of students who were taught during Introduction to the Clinic both Fall and Spring, there have been an increasing number of students from other medical schools in the country applying for an elective clerkship every month. Other members of the department served as internship advisors, elective advisors, and Tutors. Michael Gimbrone, a fourth year student received a magna cum laude for research done in our department and four other Harvard Medical students are carrying out year round investigations, working with us while they are continuing to go to school.

b) *Postgraduate Education.* Dr. Stephen Shochat completed his chief residency in June, spent six months in our laboratory and then left for Birmingham, England for six months training in thoracic surgery with Professor d'Abreu. Dr. Justin Kelly completed the chief residency in December 1970, and returned to the Royal Children's Hospital in Melbourne, Australia.

In addition to the training of our own residents we helped in the training of two other people for careers in pediatric surgery. Dr. Samuel Kim did such a good job with us as a senior resident for six months that we were able to arrange a year for him as Senior Registrar at the Children's Alder Hey Hospital in Liverpool with Mr. Peter Rickham. Dr. Kim received his support from the Andrus Fund during that year. We were pleased that upon his return he was offered a staff position at the Massachusetts General Hospital.

Dr. Patricia Donahoe spent a year in our laboratory and three months as a senior resident. Since we had no further places in our program we helped her to arrange continued training which included one year at the Massachusetts General Hospital followed by one year with Mr. Rickham in Liverpool as a Senior Registrar.

c) *Community Education.* This was the first full year of a collaborative program with the Department of Surgery at North Shore Children's Hospital, in which one member of our department gave a seminar or rounds there each month. This program has been received enthusiastically and will be continued.

During the year we also had groups of pediatricians and surgeons as our guests for a day of clinics and lectures on new developments in pediatric surgery. The largest group included 75 surgeons from Connecticut and New York. In addition, members of the department gave more than 100 addresses at hospitals throughout Massachusetts and in other states during the year.

RESEARCH

In November, the surgical laboratories moved to the 10th floor of the new Laboratories for Pediatric Sciences building. We were joined there by Professor Edward Merrill and four postdoctoral students from the Massachusetts Institute of Technology who are working full time on the problems of silicone diffusion of drugs and lechithin aerosols for hyaline membrane disease. In the laboratory during the past year a silicone endothracheal tube was developed which is impregnated with cortisone and which secretes this for three months. The work on tumor-angiogenesis-factor continues. Dr. Dorothy Tuan, a nucleic acid chemist, has joined us to help with the further isolation and purification of this material. Other investigations are underway concerning the mechanism of tolerance and enhancement, and the method of lymphocyte killing of target cells. A method of rapid detection of endotoxin in the bloodstream is being studied.

Dr. C. Everett Koop, Surgeon-in-Chief of the Children's Hospital of Philadelphia was our Visiting Professor this year. He assisted in the operating room, gave a CPC, and made rounds with our house staff. His visit was one of the highlights of the year.

During 1970, funds earned by the members of the Department of Surgery were used to purchase monitors for the intensive care unit on Division 24, cautery machines for the operating room, new cystoscopy equipment for the operating room, and for travel pay for residents and nurses to attend out-of-town conferences.

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